

Don't stop our mackerel fishing!

ENGLISH hand-line fishermen in Cornwall were last month urging their Ministry to promise that they will not be stopped fishing if the big ship fleet working the area takes the total mackerel catch over the limit.

The mackerel fishery off the English south-west coast is now joined by purse seiners, large stern trawlers and pair trawlers. The season that should stretch from September through to about March. Catches had been restricted to 3½ tons a day per crew member. Even then it was feared that the big fleet might haul up 100,000 tons in the first five weeks of autumn fishing.

Now the limit has been raised to five tons!

In the north of the British Isles, more than 100 Scottish vessels were fishing for mackerel last month.

Most of their catches were sold direct to a fleet of Eastern European factory vessels.

The eventual catch was expected to be around 100,000 tons, double last year's total.

Warning from Norway

THE heavy mackerel fishing by EEC and Norwegian boats is hitting the North Sea stock hardest of all, according to biologist Erling Bakken of the Institute of Marine Research in Bergen.

He has warned that there is again a risk of overfishing, as happened in 1977, despite all the advice of fishery research workers.

Norway and the EEC agree that the 1978 mackerel fisheries should be concentrated in the north-west area of the North Sea.

A search for mackerel north of the 60th parallel made by the Norwegian Fisheries Directorate has revealed nothing of consequence so far.

With very good catches along the Norwegian coast (about 13,500 tons by the third week of August), scientists fear that the mackerel stock may be under too much pressure to produce the spawn which, it is hoped, will rebuild the depleted North Sea stock by 1981.

As grounds for their fears, the scientists point to the very large size of mackerel being sold in Norway. These are eight or nine years old. There are very few young fish, indicating ominous gaps in the age composition of the North Sea stock.

SRI LANKA PAYS FOR PAST MISTAKE

SRI LANKA has had to pay nearly two million US dollars as compensation to Norwegian shipyards and to a firm of brokers because of a trawler building contract entered into by the previous government in 1976.

FNI correspondent Nalin Wijesekera reports that the Norwegian government took up the claims for compensation.

The contract was valued at about Rs200 million (£6.5 million) and was for ten 30 metre long trawlers.

It was signed in Oslo at about the same time that Japan offered to build

ten trawlers for Sri Lanka for only Rs60 million.

A payment of Rs3 million to the trading company which negotiated the contract is part of the Rs27 million compensation which the present Sri Lanka government has agreed to pay to get out of the deal.

When the purchase of the ten trawlers was under discussion, the Norwegian aid organisation NORAD expressed doubts

about the type of vessel planned. It was, NORAD suggested, not really suitable for the fishing requirements of Sri Lanka.

Norway was also prepared to evaluate the trawler project in 1976 on an inter-governmental basis and then arrange contracts for suitable vessels. This offer was not accepted.

The original claim by the yards and the broker amounted to Rs37 million. But a Rs10 million deduction was agreed after negotiations in Oslo between the builders, representatives of the Norwegian government and a three-member team from Sri Lanka.

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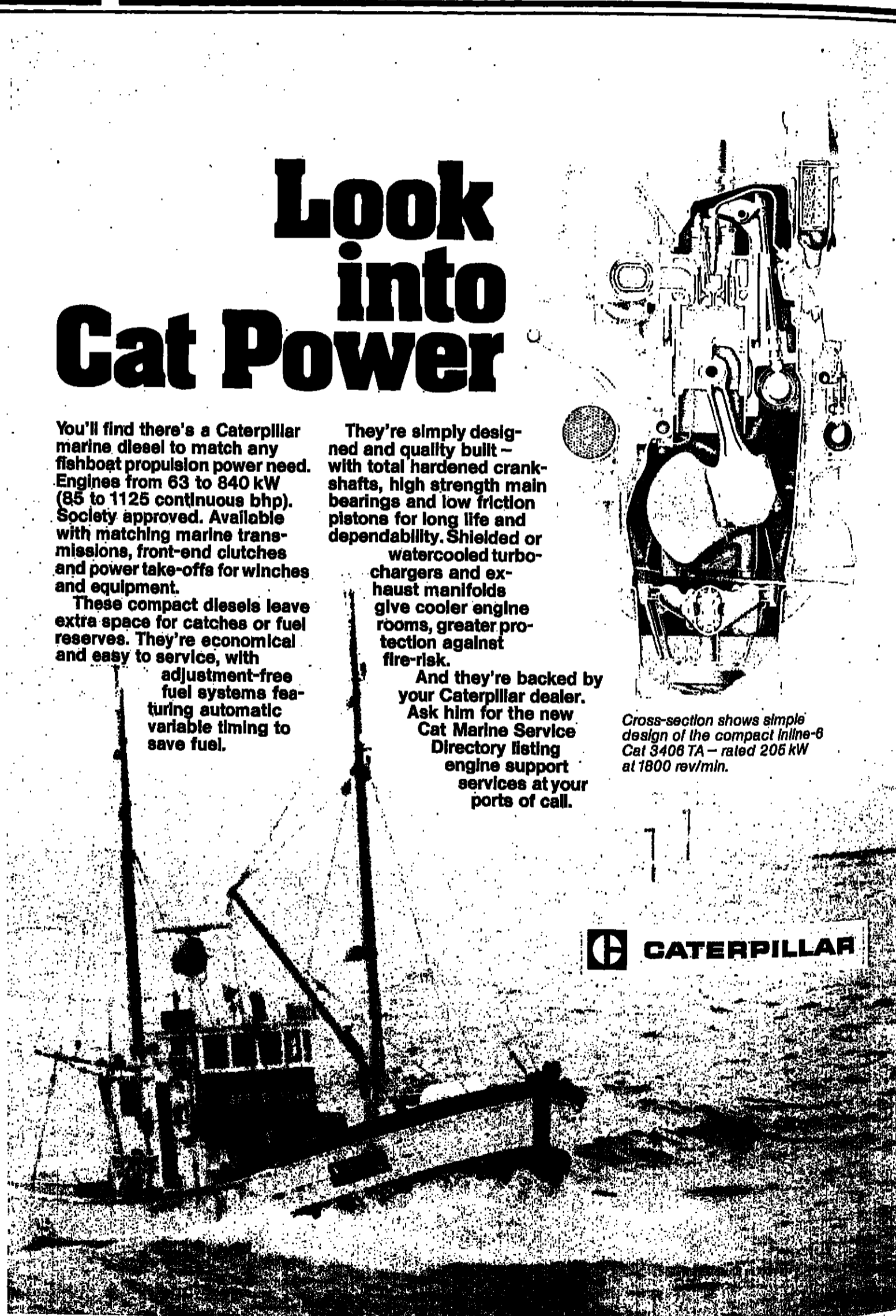
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fishing news international

October 1978 Vol 17 No. 10

75p monthly



Spanish deal opposed



Britain against increase in Spanish boats in EEC waters — Page 3

China venture

Japan's Taiyo company to help big Chinese project — Page 3

FISH EXPO RECORD



American show in Boston set for new high figures — Page 12

Food plants in Peru

Peru government sells its nationalised plants — Page 16

ANOTHER AUTOLINER

Trawler converts to supply drying factory — Page 26

Top seiner centre

Training school opens at Austevoll in Norway — Page 28

NEW GEAR for anchor seining

Grimsby boat succeeds with winch-reef system — Page 38

for long lining

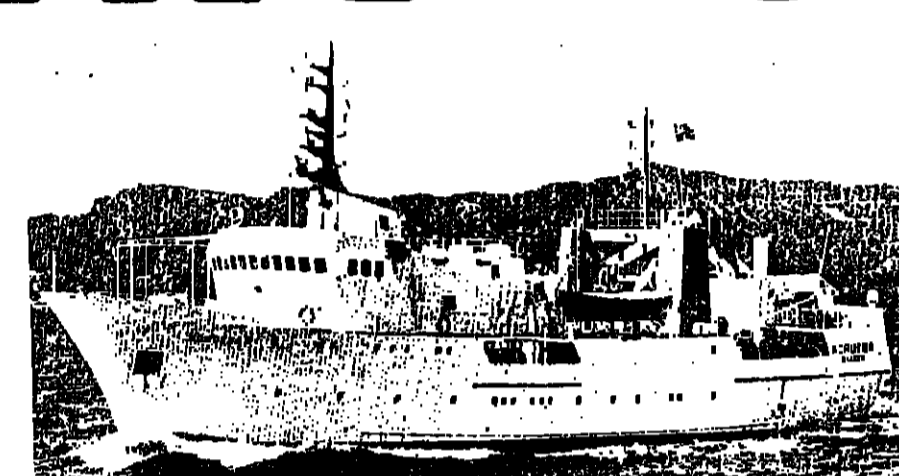


WFA helps develop method for small boats — Page 40

New sonar system

German aid to fish finding — Page 44

NORWAY'S GIFT SHIP



THE NORUEGA — £3 million donation from NORAD to Portuguese fisheries research

NORWAY HAS given away another modern fishery research ship, this time to Portugal.

The *Noruega* is a Nansen-class ship displacing 950 tons. Her design was developed by the Fisheries Directorate in Bergen in collaboration with the Norwegian aid organisation NORAD.

Other ships in the class include the *Dr. Fridtjof Nansen*, which has carried out survey work off Mozambique, the Seychelles and Sri Lanka, and the *Bien Dong*, given to Viet Nam.

The *Noruega* has been designed for fisheries and oceanographic research and is equipped with fish sampling, biological and hydrographic laboratories.

'Symbol of brotherhood'

Accepting the ship from NORAD, Portugal's Ambassador to Norway, Fernando Reino, saw her as a symbol of brotherhood and co-operation between two small nations.

She would, he said, be of huge assistance to the Portuguese industry in assessing stocks in the 200-mile economic zone off mainland Portugal and around Madeira and the Azores.

Portugal's Director of Fisheries, Antunes Correia, said the *Noruega's* first task will be to map and measure sardine stocks.

Uruguay courts the investors

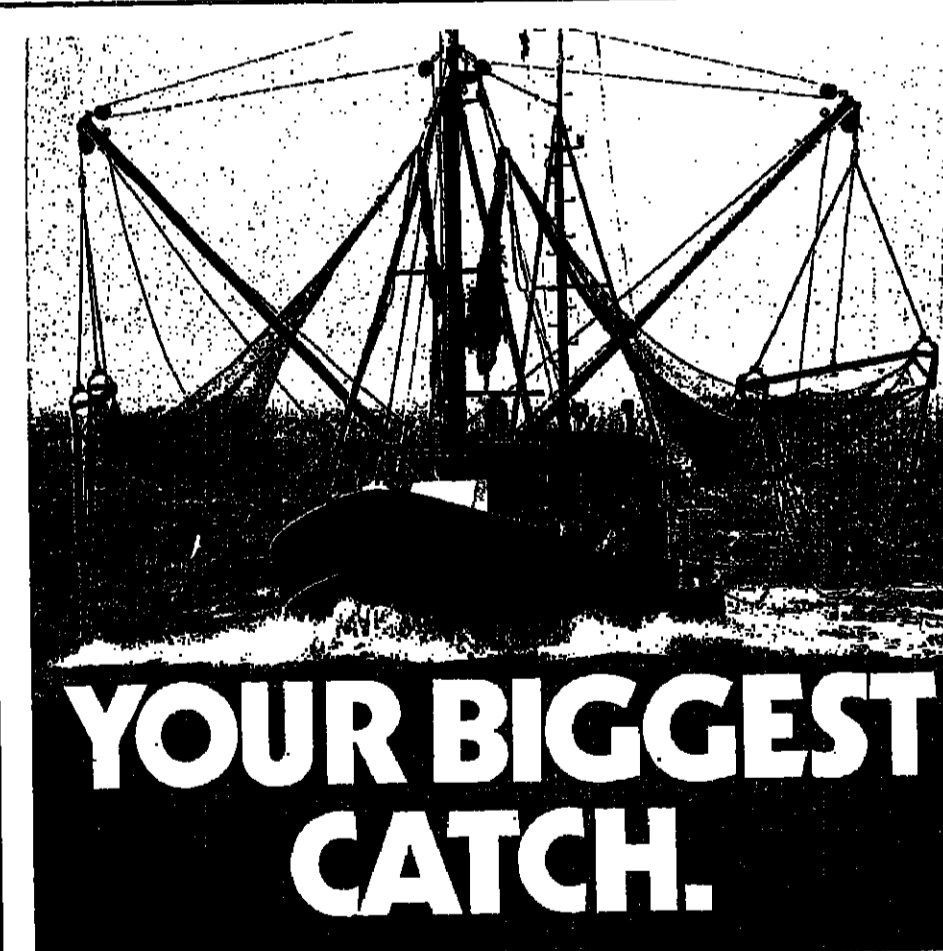
THE GOVERNMENT of Uruguay is encouraging investment in fishing by exempting investors from consular fees, import duties and credit and property transfer tax.

Landings in 1978 are expected to be about 65,000 tons and exports of products from these

landings may total US\$20 million.

Uruguay has obtained a loan of \$28 million to help finance developments in the industry.

A Dutch-Uruguayan consortium has been formed by Zaechemie, Corporacion Uruguaya de Pesca, Pesca Sur, and Compania Industrial Pesquera to invest some \$40 million in a fishing complex.



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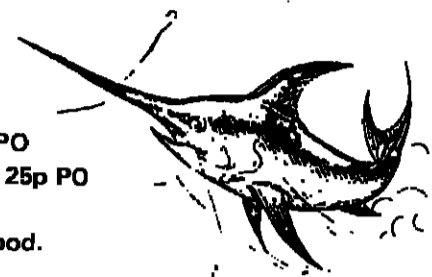


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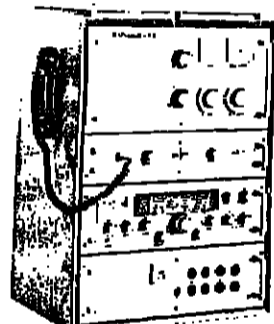
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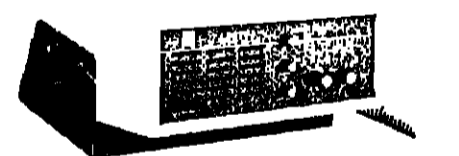
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NEWS IN BRIEF

RAILWAY wagons for transporting live fish have been under test in the Soviet Union. They will be used to move fry for stocking, in addition to fresh and salt water catches.

GHANA'S State Fishing Corporation has agreed with Sierra Leone and Gabon to allow Ghana's deep-sea vessels to fish inside their economic zones. The SFC has two tuna purse seiners and four trawlers under construction.

IRAQ is to lend South Yemen \$12.5 million as its share in the \$30 million Iraq-Democratic Yemen Fishing Company. Shore plant will be built and trawlers from Iraq will be allowed to fish in waters off South Yemen in exchange for a percentage of the catch.

EXPORTS of fish and shrimp from the Philippines last year earned just over US\$40 million. This was 58 per cent more than export earnings in 1976.

LAST MONTH the Greben yard in Vela Luka launched the first of 50 GRP-hull fishing vessels for Yugoslavia. By October next year the yard will have completed 20 of these 23 metre long boats and the entire 50 will be delivered by 1985.

Monster halibut puts chefs in the soup

225-POUNDER SETS A FIVE-STAR CHALLENGE

CHEFS AT the five-star Carlton Hotel in Bournemouth, England, faced a culinary challenge when their usual supply of fish was supplemented by a monster halibut.

Caught off Aberdeen, Scotland, the halibut had a gutted weight of 193 lb and was estimated to have weighed about 225 lb when

landed aboard the boat. Chef de cuisine Roger Chant said he had never seen a fish so big.

With second chef Peter Bentley, and other helpers, he manhandled the halibut into the kitchen. Then, when problems of cooking it were solved, it appeared in varied dishes in the hotel restaurants.

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Taiyo to help China move out to sea

JAPAN'S giant Taiyo fishing company is to help China modernise her fishing industry.

Initially, it will assist in a programme of Chekiang province. This includes building a port complex and creating a large pelagic fishing fleet.

With technical assistance from the world's top fishing nation, the Chinese are hoping to carry out a thorough reorganisation of their fishery industries, from the present heavy concentration on inland fresh water supplies to ocean hunting in the Yellow Sea and East China Sea.

Although this will increase competition with the Japanese for limited sea resources, it could open up an enormous fishing vessel market for Japan's shipbuilding industry.

The Chekiang programme alone may require some 100 new vessels ranging in size from 140 to 200 tons. Other vessels mentioned include a factory mother ship.

Britain fights EEC's deal with Spanish

FOLLOWING negotiations in Brussels last month, the number of Spanish vessels licensed to fish in EEC waters has been increased from 121 to 240. This amounts to about two-thirds of the Spanish fishing craft that have been operating within the EEC economic zone.

A few days later, however, the United Kingdom objected to the new arrangement on the grounds that agreements between the EEC Commission and third countries should not be completed until there is agreement within the EEC on the allocation of fish stocks.

Britain has been in dispute with her fellow members of the EEC over her quota share.

Under pressure from other EEC members, British Fisheries Minister John Silkin eventually accepted the increased licences for Spain on a short-term basis. But he refused to agree to accept them within a five-year framework agreement.

Other good news for the Spanish industry was that a court in Bordeaux, France, found in favour of several vessels arrested in June. It ordered that the value of fish confiscated be refunded and nets returned. The decision was based on the treaty signed between Spain and France in 1966.

The decision affects eleven vessels detained in French ports, one in Ireland and two recently arrested there.

New Chile freezing plant

IN THE seaport of city of La Serena in Chile's Fourth Region, the regional government has approved a new freezing plant.

The main fish lines will include mussels, clams, locos (similar to abalone), mackerel, hake, sea bass and sardines. It will also can mussels, clams, scallops, mackerel and sardines.

Cooked and packed shrimps being placed in an IQF freezer in Cochlin. Thanks to increased orders from Japan and improvements in the US market, shrimp exports could soon be providing a big boost to India's fish industry. FAO picture.

SHRIMP SET TO BOOST INDIA FISH EXPORTS

Promising increase in Japan order

THE EXPORT outlook for Indian seafoods in 1978 has brightened considerably with increased bookings of shrimp from the industry's biggest overseas customer, Japan.

Figures for January-June place exports at 37,754 tons valued at Rs 963.8 million (£61 million) against 31,933 tons valued at Rs 860.3 million in the corresponding months of 1977.

In March-May, the first quarter of the

current fiscal year, export earnings totalled Rs 490.3 million, against Rs 426.2 million in 1977.

This year's shrimp catch is said to be better than last year's, while overseas demand is good. Prospects for the rest of the year are still better, reports FNI correspondent Trevor Diseberg. The major boost to exports comes from Japan as a result of the present strength of the yen in terms of the dollar.

Indian exporters are realising higher prices in dollars for all three choice varieties, headless white, headless tiger and flower.

Rise expected

Since Japanese buyers' inventories are reported to be low and buying in Japan is more active in September, October and November, sales are expected to rise still further in these months.

Steady buying is reported from Europe. The United States market is somewhat sluggish but is expected to pick up soon.

Pursers' surprise capelin bonanza

NORWAY'S fleet of large purse seiners had an unexpected bonanza last month when they found a stock of fat capelin west and south-west of Jan Mayen Island.

The island belongs to Norway and lies roughly halfway between the northern Norwegian coast and Greenland. Ten years ago purse seiners from Norway and Iceland travelled there to harvest what was left of the summer run of Atlantic-Scandinavian herrings.

First news of the fish came when the purse seiner-trawler *Meloyvar* brought in 1,300 tons. Within a few weeks more than 15,000 tons had been taken.

The bonanza has helped revive interest in establishing a 200-mile economic zone around Jan Mayen.

Norway has argued for a median line but Iceland has disputed this on the grounds that Jan Mayen is not really inhabited, except by weathermen.

PUNJAB ACTION PLAN

THE government of Punjab province, Pakistan, has drafted an action plan for 1978/79 to implement 13 schemes for inland fisheries. The fisheries department in the province aims to stock 3.8 million fish seed over the yearly to June 1979.



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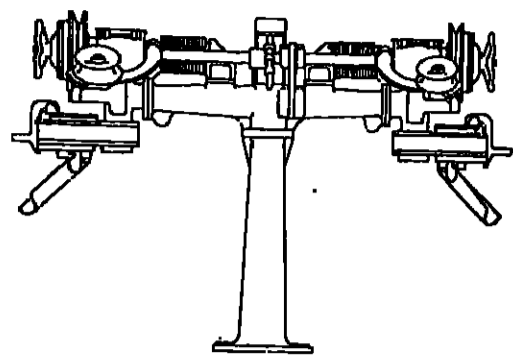


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REVIEWING the year ended March 1978, the Fishing Industry Board describes it as the most significant in the history of the New Zealand industry.

A number of government actions removed or helped to overcome many of the constraints that previously hindered the industry's development. Substantial incentives were offered in the 1977 budget. With the passing of significant fisheries legislation, these did much to convince people in the industry that its economic potential and its problems were being recognised.

"These actions," commented the Board in its annual report, "do not overcome all the problems, and in some cases have created others. Nevertheless, the industry is better placed than ever before in its history to face the future with confidence."

Irish bring in a 'survival quota'

FROM OCTOBER 1, the 8,000-strong Irish Fishermen's Organisation is operating its own system of management and control over herring catches in the Celtic Sea.

A "survival quota" has been made necessary, it says, because of the serious danger to the resource and the attitude of the Minister for Fisheries and his officials to IFO draft proposals.

The IFO points out that since the closure of the Celtic Sea in early 1977, Dutch trawlers have been taking 15 per cent herrings from the area under a five per cent by-catch agreement. Bearing this in mind, the IFO prepared a management plan based on a total allowable catch of 3,000 tons for the period.

Dunmore East is the sole landing port under the "survival quota" scheme. A port committee there will monitor catches. Fishing will take place on five nights a week and the quota for each night will be two crans (about 360 kg) per man. Manning rules are six crew for a 65 to 75 ft. boat, seven for 75 to 80 ft. and eight for a boat over 80 ft.

If any boat takes over its quota on any night, the excess will be allocated among boats which have not reached their quota.

Vessels with an excess catch have to radio others in the vicinity to make arrangements for distributing the catch.

The IFO has also called for the establishment of a team of fishery protection officers. It suggests that any vessel longer than 24 metres (78.7 ft.) b.p. should be required to carry a fishery protection officer aboard while it is fishing inside the Irish 200-mile zone.

Taiyo and Nippon Suisan carried out a test fishing operation off Patagonia in May. This was encouraging and led to preparations for constructing a base and processing plant.

The survey team will pick one or two possible sites, and a second team will arrive later this year to make a final decision.

Japan surveys Argentina bases

A JAPANESE survey team arrived in southern Argentina last month to investigate areas for a fishing base. They represent the five-company consortium (Nippon Suisan, Nichiro, Taiyo, Hoko and Kyokuyo) which has an agreement with the government of Argentina to develop Patagonia fish resources.

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Nordsee drops Canada plan

THE BIG German fishing company, Nordsee of Bremerhaven, has dropped plans to buy a controlling interest in a Newfoundland fish factory because the Canadian government refused to issue licences required for five Nordsee trawlers.

Slow processing of its application to operate in Canada also put off the German company.

The deal would have brought millions of dollars and at least 500 full-time jobs to the Ocean Harvesters factory in Harbour Grace. But leaders of Newfoundland's fishermen's union feared that entry of Nordsee and its big trawlers would cut into the cod stock which provides the main supply of raw material to the province's inshore fishery.

Acceptance of the Nordsee proposals would have brought a rush of other companies into the Canadian fishing industry, said union leader Richard Cashin.

Nordsee had been left with no choice but to withdraw, said Ocean Harvesters president Alec Moore, because "Canada has no fisheries policy" and no guidelines had been laid down by the federal government for the takeover envisaged.

A NEW FOUND BRIGHT SPOT!

TEN YEARS ago fishing was a badly depressed industry in Newfoundland; today it is one of the few bright spots in a generally dismal economic scene.

In the closing years of the 1960s, fishing was coming to be regarded as poorly-paid drudgery. "Now fathers and sons are going back," said an official of the province's fishermen's union.

Landings and earnings are rising. There is a new surge in boatbuilding.

One of the reasons for the revival is the price now being paid for catches. In 1968, cod was

selling for a derisory three cents a lb. which was below what fishermen needed to cover costs.

Now it is selling for 18 cents, still low by European standards but offering the prospect of steadily improving earnings.

It is estimated that at least 24,000 Newfoundlanders earn their living from fishing and fish handling.

Much of the credit for the improvement goes to the new protection of stocks and local markets through the 200-mile limit.

fishing news international

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people engaged in an industry that is
harvesting and handling 73.5 million tons of
aquatic creatures and plants a year.

TURNAROUND IN A BRITISH FISHERY

comment

THE USUAL relationship between marine scientist and fisherman might be briefly expressed as informed caution restraining commercial optimism. But in fisheries these days, many things are being turned upside down. And in one area at least we have a group of fishermen criticising fishery research establishments for talking "dangerous nonsense" about the state of a resource that is being increasingly heavily fished.

Mackerel is the fish and the area is off the south-west coast of England. Developments there have been extensively reported in *FNI*. As cod and herring fishing have declined, the mackerel has risen to prominence and is now the largest volume catch in the British industry.

But the increase has gone mainly into the holds of the big trawlers that have lost cod and of Scottish purse seiners and other high-performance boats that have lost herrings. And from these vessels almost all the fish moves straight to export markets, frozen and often in factory ships that buy direct from the catchers.

This, as we have said before, is no unhealthy development as fisheries extend to 200 miles and take in species that have no big outlet in the coastal country. But in England, the newcomers and their customers are seen as greedy and destructive interlopers by the small-boat fishermen who for years dipped lightly into the mackerel. Their catches have also

gone up, but they fear for their future if the total haul is not kept strictly within safe limits. The problem is to decide on what is "safe."

Acting on advice from ICES (which is made up of European fishery scientists), the United Kingdom set total quotas which reflected new knowledge of the size of the south-west mackerel resource. To restrain the incoming large boats, the quota per man was set at 3.5 tons a day. Last year the south-west fishery contributed the major share of a record UK mackerel haul of 188,000 tons.

In the eyes of the small-boat men, this was already taxing the stock. Not so, said the scientists. On their advice, the government decided this year to allow a quota

of five tons a man. New information, not available when earlier assessments were made, indicated that the maximum catch within EEC waters might be raised from a recommended 250,000 tons to 460,000 tons.

The local fishermen dispute this optimistic assessment. They have protested, pointing to the sad example of the herring stocks. They allege that it was misleading information from scientists that led to the near-depletion of the North Sea herring resource.

They may yet get more restraint over fishing. But not so much through their arguments. So many vessels and fishermen have converged on the area that the sheer size of the effort may force a cut in the quota per man

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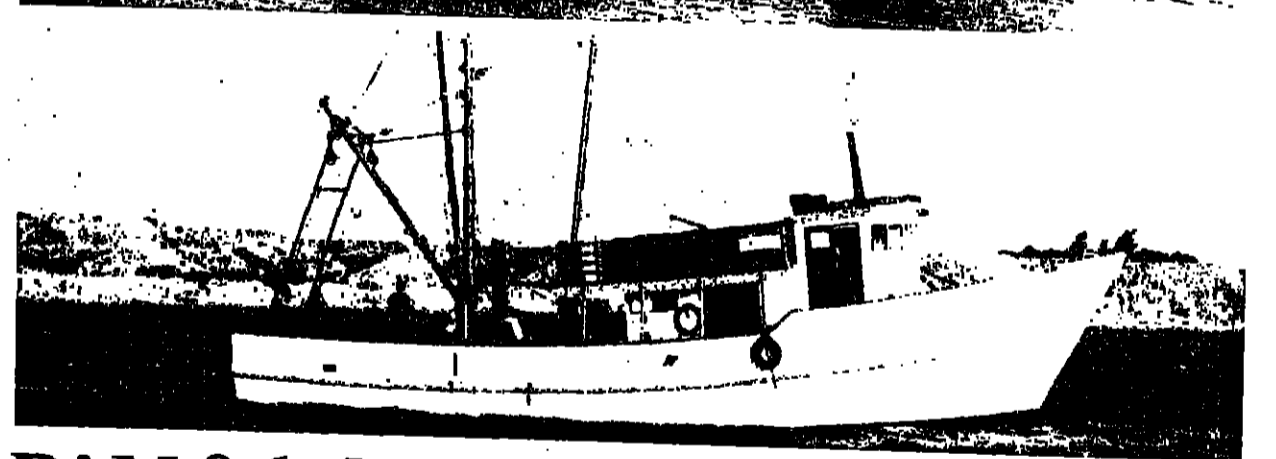
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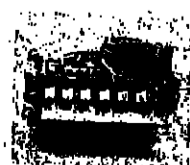
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Australian rush

RADIO AUSTRALIA reported last month that more than 40 applications had been received from foreign fishing companies and countries to operate within the 200-mile economic zone. Legislation has been before the Australian Parliament and

the zone is expected to be proclaimed soon. Applications have come from fishery interests in ten different countries. Several countries (including the USSR, West Germany and Japan) also have begun talks with Australian officials aimed at developing joint ventures.

Survey spreads

THE FLEET of Norway's Institute of Marine Research is presently dispersed over the oceans, from the Arctic to the Indian, on fishery resource surveys.

After working off the coast of Mozambique and around the Seychelles, the Dr. Fridtjof Nansen has just completed an investigation of waters around Sri Lanka. Norwegian and Sri Lanka fishery scientists took part in the expedition.

In conjunction with Soviet vessels, the G. O. Sars and

Johan Hjort have been assessing the spawning stocks of major food species between Norway, Zemlya and Bear Island. They are now engaged in an assessment of capelin stocks in the Barents Sea.

Soon retired

The oldest Norwegian research vessel, the Peder Ronnestad, which will soon be retired, has been carrying out surveys in the fjords of West Norway.

THE YARD THAT

Cubans' giant order held up

JUST five years ago, during the Vigo fisheries exhibition, Spanish and Cuban VIP's watched the formal cutting of the first plate of a shipbuilding order worth more than US\$200 million.

The shipyard was Astilleros Construcciones, and the order was for 26 big freezer stern trawlers, six of which would be built by another of Vigo's big yards, Astilleros Hijos de J. Barreras.

At a time when pessimists foresaw a reduction in home market construction, this contract was very welcome, especially as the Cuban vessels were to be serviced and repaired in the Ria de Vigo.

Yet today the situation is not a happy one, with four vessels not yet completed at the Ascon yard. As reported in FNI last month, the yard has for six months been idle as a result of industrial troubles which, according to some, need never have arisen. And these vessels were already scheduled for delivery in October, 1976, and the remainder all due in 1977.

By August 1978, the Cubans were entitled to some nine million pesetas under the penalty time clause of the contract. During August, however, there arrived in Vigo a group of top executives from Marpesca, the Cuban management

group which succeeded Cubapescas, and this was seen as an attempt to get things moving again.

The new owners of the Ascon yards — they took over some two years ago — were not impressed. They had asked for new prices to be negotiated for the four remaining ships to take into account general cost increases, but to this the Cubans could not agree, arguing that the yard's failure to deliver on time had cost them enormous sums in lost earnings.

There were hints that the new owners were not keen to re-open the yard and continued to build at a loss.

Meanwhile, as the dispute reached ministerial level, the Cubans were visiting yards to discuss the order for the new shrimp boats, with Santo Domingos as hot favourite.

The placing of such an order with Vigo yards would be seen as an act of good faith on the part of the Cubans who have emphasised that their quarrel is with Ascon's delivery dates. In other respects, they say they are quite happy with Vigo shipbuilders.

MINNOWS WANT THEIR SHARE...

DISCUSSIONS have been taking place between the Ministry of Industry and Energy and the smaller shipyards in Spain to try to work out how they will survive the present crisis in the industry.

These yards claim that all the government action taken to assist shipbuilding will help only the three largest shipyard

groups. But the smaller yards employ about 13,000 people and account for about a quarter of vessel tonnage and they say their problems merit attention.

As noted in FNI in September, the yards are also the builders of fishing vessels in Spain.

It is hoped that orders from Cuba may help some of the smaller yards.

Arrested!

CANADIAN and United States fishery officials have made their first arrests in the complicated and slow-moving boundary dispute between the two countries.

Steve Robins, a lobster fisherman from Stonington in Maine, pleaded guilty in a Yarmouth, Nova Scotia, court, for fishing in Canadian waters. He was fined \$1,000. His 20 traps worth \$2,000 and a catch of 873 lb of lobsters valued at \$1,700 was confiscated.

In Seattle, Joseph Negro of Vancouver was found guilty of fishing inside the US zone and fined \$1,000. His small boat was returned to him. He could have been fined up to \$50,000.

The arrests seemed to drive home the apparent failure of continued negotiations to solve the boundaries dispute. This flared up in June when both countries ordered each other's fishermen to go home.

Both sides alleged that the other was not living up to terms of the reciprocal fishing agreement. Since then, special

FIRST VICTIMS IN U.S. CANADA BORDER DISPUTE

negotiators Lloyd Cutler of the USA and Marcel Cadieux of Canada have been coming slowly to the conclusion that third-party arbitration may be the only way to settle four disputed boundaries and set the basis for resumed fishing talks between the two.

However, there seems to be small chance of a resumption of reciprocal fishing this year. And pressure on governments to work on a 1979 agreement appears to have diminished as fishermen become used to working closer to home.

Arctic shock

THE LATEST assessment of spawning stocks of Arctic cod indicates that these may be only half what was expected. Data for the assessment was collected during the 1978 Lofoten fishery. Causes of the drop are thought to be mainly overfishing, especially the heavy catches of immature fish using illegal gear. Reported catches may have been less than the actual take, and the earlier estimates may have been too optimistic. Scientists expected a million-ton spawning class, but the assessment indicates about 500,000 tons.

It is imperative, says research director Arvid Hjeltnes of the Institute of Marine Research in Bergen, to reach agreement on increasing minimum mesh size to 135 mm from the present 120 mm. The Institute is investigating the amount of immature cod taken with illegal gear.

RAN OUT OF TIME



At the keel-laying ceremony in 1973, Cuban fishery leaders are shown round Ascon's Rios yard.

Norway's crab canners pool sales

NORWAY'S 12 canners of crabs have pooled domestic and foreign marketing in A/S Norecanners, a subsidiary of the Canners Export Council of Stavanger.

The new sales company is part of a comprehensive reorganisation aimed at improving crab supplies and production.

But recent efforts in Norway to persuade people to eat squid may have resulted in more squid going for use as bait!

The bait supply company, Fiskernes Agnorsvring, reports a record 1,200 tons of squid sold during the year ended June 30. Part of this may, however, be due to big deliveries to East European vessels.

Squid has not had any great success as a food in Norway.

Shrimpers are guzzlers

US GULF COAST shrimp trawlers can be big earners, but much of what they bring in has to be paid out in fuel.

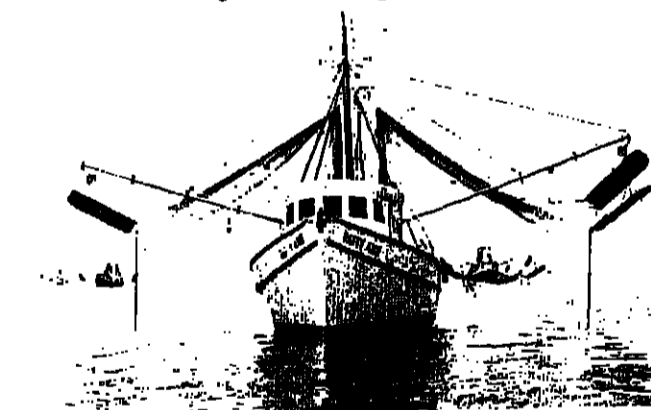
A recent analysis by the National Marine Fisheries Service shows that the Gulf of Mexico shrimp boat has the highest fuel costs relative to revenue in the US fishing industry.

Leading US fisheries such as those for salmon, crab, tuna and ground fish were included in the analysis. Relative to gross revenue, fuel costs in most of them range between

five and ten per cent. For the Gulf of Mexico shrimp fleet this figure is 16.7 to 17.7 per cent.

According to some fishery experts, this single statistic tells the story of the Gulf shrimp industry problems lately. These vessels tow an otter trawl. They are using some of the oldest gear in this category.

Most catchers use a balloon or flat net and are not familiar with V- or bracket doors. In addition, the decline in the resource requires longer towing hours and longer trips.



US GULF SHRIMPERS AT WORK: Use of old gear and methods increases fuel costs.

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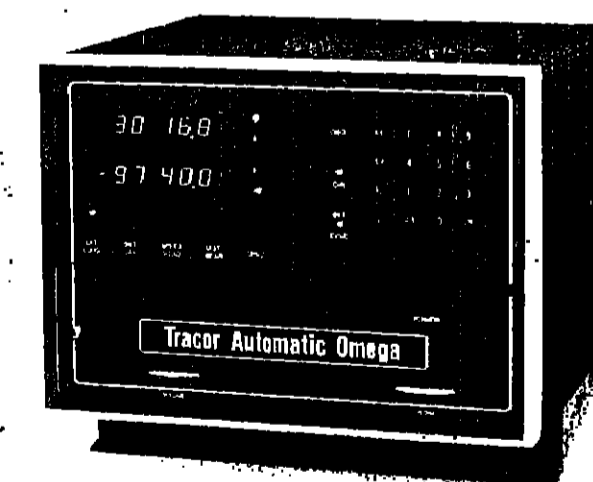
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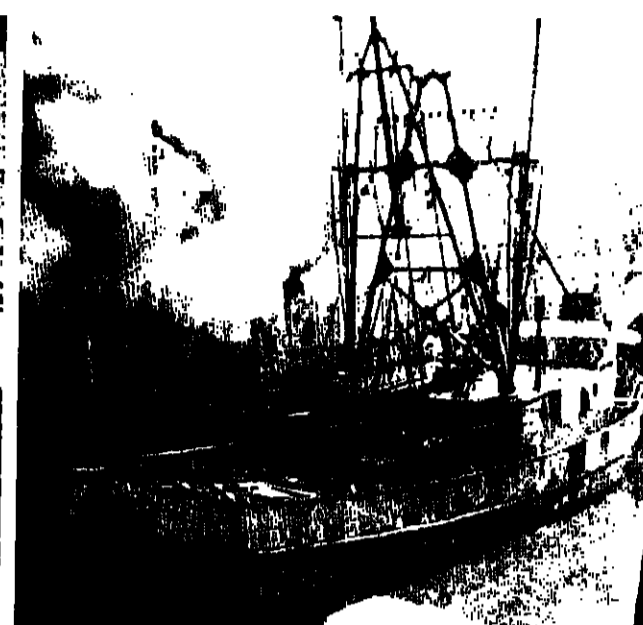
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Top Alaskan shrimper relies on WESMAR sonar



Dale Samuelson, owner and Captain of MAR PACIFICO, brought in 8 per cent of the 1977 Alaskan shrimp production while competing with 60 other fishing vessels using a WESMAR scanning sonar.



MAR PACIFICO, Samuelson's 88-foot (26m) Bender double-rig and No. 1 trawler in the 1977 Alaskan shrimp production is equipped with a WESMAR scanning sonar. Samuelson is equipping his new vessel with another WESMAR sonar.

"IT'S SUCH an advantage that I don't want anyone else to have it. It's what gives me the edge," Dale Samuelson, owner and Captain of the No. 1 Alaskan trawler Mar

Pacifico, said of his WESMAR scanning sonar. Using his sonar, Captain Samuelson brought in eight per cent of last year's (1977) Alaskan shrimp production

while competing with 60 other fishing vessels. "I'd say my production every month pays for the sonar again," he said. The owner of the 86 ft. (26m) Bender-built double-rig

Mar Pacifico shrimps out of the Kodiak-Sand Point-Dutch Harbour area of the Aleutian Islands near Alaska. "I use my WESMAR sonar strictly for bottom work. For

my application, 90 per cent of the sonar's value is in determining bottom contour," he said.

He added that his WESMAR sonar shows him bottom differences. "I like to tune the sonar so mud shows as blank on the CRT screen, sand shows as speckles and hard bottom is shown progressively brighter." The sonar also shows drop-offs and helps me lay the gear."

The sonar gives Captain Samuelson advanced information about the seabed ahead of the Mar Pacifico, allowing him to manoeuvre his vessel through channels, around reefs and rock outcroppings.

"With a depth sounder," he said, "it tells you when you're over a lump." The veteran shrimper said that, by using WESMAR sonar with its advanced information, he is able to manoeuvre his vessel around obstacles during dragging without hanging up. Because he knows the exact location of underwater obstructions, he can drag the Mar Pacifico's nets closer to

obstacles where fish congregate, helping to increase his catch.

"The WESMAR sonar is easy to operate," Captain Samuelson said. "I hardly ever touch any of the controls except for the tilt and sometimes the range. I practically never use an angle less than 40 degrees, usually between 40 and 70 degrees in 90 to 125 fathoms," he explained.

"You get lazy with the sonar. Other vessels are busy taking bearings, with the sonar, you don't have to because you know exactly where you are. There are some places where the sonar is the only way to get through, too."

Captain Samuelson recently decided to purchase another WESMAR scanning sonar, to be installed aboard his new, 127ft. (387m) vessel under construction.

"The only people who complain about sonar are those who either don't have it, or don't know how to use it," he said.

Captain Samuelson feels marginal fishermen will eventually be driven out of the business by those using sonar. "The WESMAR sonar will make fishermen more money. It gives you the edge."

WESMAR sonar a valuable aid to salmon seining

"THE WESMAR sonar is an absolute essential for salmon. You never have to make a blind set using it; it tells you when there aren't any fish, when there are just a few fish, and when there's fish to make a set on," Johnny Watson, captain of the Western Producer and senior skipper of B. C. Packers of Vancouver, British Columbia, Canada, said. "And, the WESMAR sonar helps you set so you can catch the most fish. I just wouldn't make a set now if the sonar didn't show me fish."

"When we're fishing, other guys around us who aren't using WESMAR sonars are making blind sets, and in many places, you only have one chance to set." That's how the WESMAR sonar made us money in the salmon season. It tells us when to make a set, or when not to because there aren't any fish, so we can move to another area."

Until recently, however, Captain Watson used his WESMAR sonar only to locate herring, not believing the sonar could detect salmon. "I've been fishing for 40 years with my eyes," he said, "and I

thought the only way to find salmon was watching for finners and jumpers. When I was told the WESMAR sonar could find salmon, I just didn't believe it."

After talking with a WESMAR representative who urged him to use his WESMAR sonar to locate salmon, Captain Watson decided to try the sonar on a fishing trip. He turned on the sonar, and scanned the area for salmon. Suddenly, the sonar's CRT screen showed marks. Captain Watson headed the Western Producer toward the direction the sonar showed targets, and he spotted a finner.

"There were no visual signs of salmon," he said, "but sure as heck, the WESMAR sonar showed salmon, and there they were."

Captain Watson continued to test his WESMAR sonar on salmon, which repeatedly confirmed its ability to detect the fish. One area he brought the Western Producer into was already being fished by another vessel.

"The sonar showed only a small school of fish," he said. "The other boat set, and

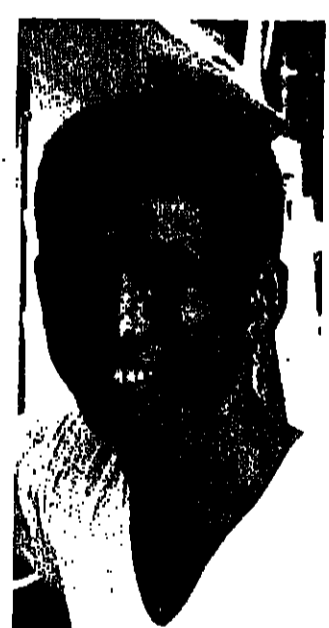
brought up 40 fish nearly the entire school."

"In that area, you can't take a chance; you've only got ten minutes to make your set and get out because of the ebbing tide. When it was our turn to set, my sonar operator, Alvin Michael Chuck, said, 'We might get one fish'. Sure enough, that's what we got, one sockeye. Every time we tried the WESMAR sonar on salmon, it proved it could find them, or told us there weren't any fish in the area."

Captain Watson said he can fish waters he doesn't know using his WESMAR sonar. "You don't have to worry about fishing in unfamiliar areas and hanging up your net because the sonar tells you right where you are."

In addition to being an essential for salmon seining, Captain Watson believes trollers would benefit greatly by using WESMAR sonar. "The trollers should use the sonar, too. If they did, it would tell them where the fish are and how deep they are, so they could run through them and catch the most," he said.

"There's no doubt, if you want to get ahead, get a WESMAR sonar. It's fabulous," Captain Watson said. "I'm in the driver's seat with the sonar; there's nothing stopping me when I use it. I'd put my life on the WESMAR sonar. When it shows fish, there are fish."



Captain Yaichiro Kuwahara caught US \$20,000 in Spanish mackerel during one set recently using his WESMAR scanning sonar.

Below: Captain Johnny Watson and the Western Producer.



Japanese purse seiner increases catch with WESMAR sonar

USING WESMAR scanning sonar, Yaichiro Kuwahara, owner and captain of the 20-ton purse seiner Compira Maru, caught US\$20,000 worth of Spanish mackerel during one set recently. This helped to increase his total catch of Spanish mackerel for the month to nearly \$100,000.

Captain Kuwahara uses his WESMAR sonar with a 60-degree tilt to locate rock piles and shipwrecks in the fishing grounds near Tsurumi, Oita Prefecture, his home port where he fishes for Spanish mackerel.

After he has located these underwater obstacles, Captain Kuwahara relies on the sonar's excellent resolution to find schools of Spanish mackerel, and manoeuvre the Compira Maru's nets to capture the greatest quantity of fish without hanging up.

"It's hard to imagine fishing without the WESMAR sonar now," Captain Kuwahara said later when talking with WESMAR representative for Japan, Phil Werdal. "I wouldn't leave port without it."

NEW WAY TO OPEN TRAWL MOUTH

A SIMPLE way to double the opening of the mouth of a trawl has been dreamed up by Menachem Ben-Yami, senior fishery industry officer of FAO's Department of Fisheries.

Like so many remarkable inventions, this one is obvious once it has been demonstrated, reports FNI correspondent Cedric Day. It consists of fixing a strip of canvas so that it falls inside the mouth of the net. This results in it being pressed up against the netting of the square as the net is towed, thus lifting the net mouth.

"It is an idea I have considered for some time," Mr. Ben-Yami told me when I saw him recently in Rome. "I was able to test it when I went to Hull a few weeks ago and rigged up a model for demonstration in the flume tank of the White Fish Authority's Industrial Development Unit there."

"I have been experimenting with trawls all my life," Mr. Ben-Yami said, "but this is the first time I have been able to watch one in action. We could see exactly how my idea worked."

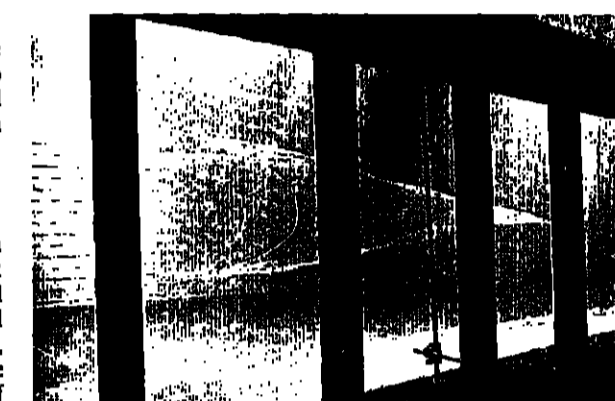
'Sail kite'

He used a model of a medium opening trawl net with V-shaped wings and attached the canvas "sail kite," as he calls his invention, to the length of the boom, the width of the canvas being half its length. He left all ten floats on the headline in the first test. The results, converted to those for an actual full-size trawl, were:

Fishing height at the centre of the mouth of the net fitted only with floats, trawling at 2 1/2 knots, 3.9 ft. Fishing height at the centre of the mouth of the net, same trawling rate, with all floats attached and the "sail kite" on, 8.5 ft.

A further test with the "sail kite" on the net and only one float attached resulted in an opening of 4.5 ft at the centre of the mouth of the net.

"These tests have demonstrated the principle of how a significant improvement in fishing height can be obtained," said Mr. Ben-Yami. "I was somewhat



The White Fish Authority flume tank at Hull, showing an inshore pair trawl under test. Now designers can see what their nets will do under tow

astonished to observe how effective the sail-kite was, and so were the skippers who were undergoing a training course at the establishment and were present during the tests."

The main need now, he explained, is for skippers to test the use of the sail-kite in actual fishing. It will also have to be used on various types of nets to find out how effective it is on each type.

Leader rope

To ensure that the sail kite flops into position inside the net mouth when the trawl is shot, Mr. Ben-Yami suggests that the back edge of the kite

should have a leader rope attached. This should prevent it falling downward when the net is shot, thus automatically flopping into the mouth.

Pressure of the inflowing current of water will then push it into position against the netting of the square. He added that care must be taken not to make the sail kite bigger in width than a third of its length because it would then tend to lift the net too high.

"I would like to see skippers in various kinds of fisheries try out the sail kite so that we can have practical proof of its effectiveness and find out the extent to which it can increase catches," Mr. Ben-Yami said.

FERTILISERS BOOST SALMON RUN...

BY SPREADING fertiliser on a Vancouver Island lake, Canadian fishery biologists have boosted its sockeye salmon run from about 50,000 fish in 1970 to more than one million in 1978. The landed value of the 1978 harvest is estimated at some \$5 million.

If the spreading of nitrates and phosphates on other lakes proves as successful as the Great Central Lake experiment, British Columbia's sockeye production could double or even treble in the next ten to 20 years, according to Dr. John Stockner, who heads the 20-man research team.

The project began when researchers became excited by reports that sewage dumped into Lake Washington, near Seattle, was increasing the size of salmon smolts in the lake. They decided to start tests in Great Central Lake.

Fertiliser put into the lakes increases the amount of plankton on which young sockeye feed. And the larger the size of the sockeye smolts when they leave the lake, the better their chance of survival in the Pacific Ocean.

Plankton feed

At first, the fertilisers were spread on the lake by boat. Now this is done by aircraft normally employed in fighting forest fires.

"It is our most successful salmon enhancement programme so far," said Dr.

Stockner. "It is also the largest fish research programme in British Columbia and the best cost-benefit project in the salmonid enhancement programme."

Five other lakes are now being fertilised: Long Lake, Henderson, Kennedy, Mohun and Hobiton Lakes. If the experiment is as successful on these lakes as it has been on Great Central, others will be given the same treatment, including some on the mainland.

Years ago, adding fertilisers to boost salmon returns would have been thought unnecessary. A commercial fishery had not fully developed and sockeye runs were counted in millions of fish. When the adults had spawned, they died, decayed and provided nutrients for the plankton. Now, with fewer fish, artificial fertilisation has become necessary.

About five tons of fertiliser a week is added to each lake. This costs about \$20,000 a year and the cost of chartering a water bomber aircraft is nearly \$700,000. But the experiments have shown startling results in Barkley Sound on the west coast of Vancouver Island.

There, ten years ago, 30 gillnet boats in sound caught about 28,000 fish a year. Now, more than 250 gillnetters and 150 purse seiners fish in the sound, with an average total catch of more than 330,000 fish.



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from the dockside

FIRST THE fleet; now the factories. In Peru, the operative word in the fishery industry these days is "deprivatisation." There has to be a better word to describe what is happening, but I can't think of it!

What it means is that, piece by piece, the government is trying to sell the industry back to the people who had it taken from them not much more than five years ago.

It was not one of the most brilliant feats of nationalisation. The anchovy sector, the mainstay of Peruvian fishing, had already slumped. There were too many boats in the fleet and too many factories to handle their depleted harvest.

From the noises the government made, it was going to solve all that. But, despite cutbacks and controls, the anchovy stock has yet to recover, and the industry is even more depressed than it was in May 1973.

Although, the meat factories continue in government hands, the fishing fleet has already been sold back — to numerous private owners who have since pleaded for the

factories so that catcher and processor can be linked in integrated companies.

First, however, they are being offered the food fish plants. EPSEP, the state project set up to handle most of the food fish industry, is being dismantled and its hardware sold.



● Norway's Law of the Sea Minister Jens Evensen after one of his meetings on fishery limits. See Evensen signs off.

Fisheries Minister Francisco Mariategui is pressing private industrialists to buy his wares. If they do not, he warns, the private sector and the country will be losing a "magnificent opportunity."

The opportunity (and what Peru's fishing people think of it) is described in a special article on Page 15. For the fish meal industry, with its private fleet and nationalised plants, business resumed with a splash last month.

Some 130 purse seiners were allowed out for five days a week from September 19, and this was almost double the number permitted before fishing was stopped on July 17. Catching was being restricted to jack mackerel, pilchards and saury. But the limit for other species (mainly the depleted anchovy) brought in with the catch was raised from ten to 20 per cent.

The step-up was allowed following reports from the Instituto del Mar that the anchovy stock is recovering gradually (we seem to have heard this several times since 1970). Although still dangerously low compared with the 20 million tons of the good years, it has been assessed at around 4.8 million tons compared with only 2.5 million tons earlier in 1978.

Evensen signs off

When he meets Soviet Fisheries Minister this month for further talks about protection of fish around Spitzbergen, Norway's Jens Evensen will be carrying out his last duties in a post whose creation and duration over four years reflected the special demands of fishing limit negotiations.

Mr. Evensen was head of the Department of Legal Affairs in Norway's Foreign Ministry when it was decided to form a special post in the government for a man to lead Norway into her regime of extended limits.

The original title was as complicated as the duties were confusing. It soon shortened to Law of the Sea Minister and to a clear line of action by Jens Evensen and his team. He carried out a series of demanding tasks with skill, tact and the sense and the courtesy to realise that Norway's position would be better understood if it was explained rather than proclaimed. He will probably return to the Foreign Ministry as a special adviser. With him will go the respect of the many people in fisheries who got to know him during his time as Minister.

Salad suggestion

United States officials say they still lack the final convincing proof that the case of botulism in England in July (see *FNI* August and September) was caused by salmon canned in Alaska.

Speaking for the Food and Drug Administration in Washington, Nancy Gillick said the four victims ate a salmon salad. Other ingredients might have been responsible for the poisoning.

As we reported in *FNI*, British food scientists have no doubts over the source of the botulism. Saline washings from the can and particles found in it were injected into mice which quickly died. Final diagnosis of the poison as that from the spores of *Clostridium botulinum* type E was confirmed weeks later through cultures.

Salmon fishermen and packers in the Pacific north-west were, of course, deeply upset by the British government warning to consumers not to eat US canned salmon until further notice.

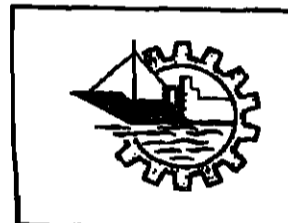
"We are concerned and the British buyers are concerned about a move in Britain to take all US canned salmon from store shelves," said Bill Franklin of Kelly-Clarke of Seattle, a selling agent for canned salmon.

It is more than a move. Within hours of the initial warning going out, canned salmon fell out of the market in the United Kingdom, and within days there were few cans to be found anywhere in Western Europe. Mr. Franklin will still have a job locating a can of US salmon on a British shop shelf.

Canners, wholesalers and retailers will now have to launch a comeback campaign that will reassure consumers that canned salmon is safe.

Peter Hjul

construcciones navales santodomingo



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Breadth: 9 m.
Approx. dead weight: 350 T.

Shipway N.º 2
Covered:
Length: 80 m.
Net breadth: 19,70 m.
Approx. dead weight: 7,000 T.

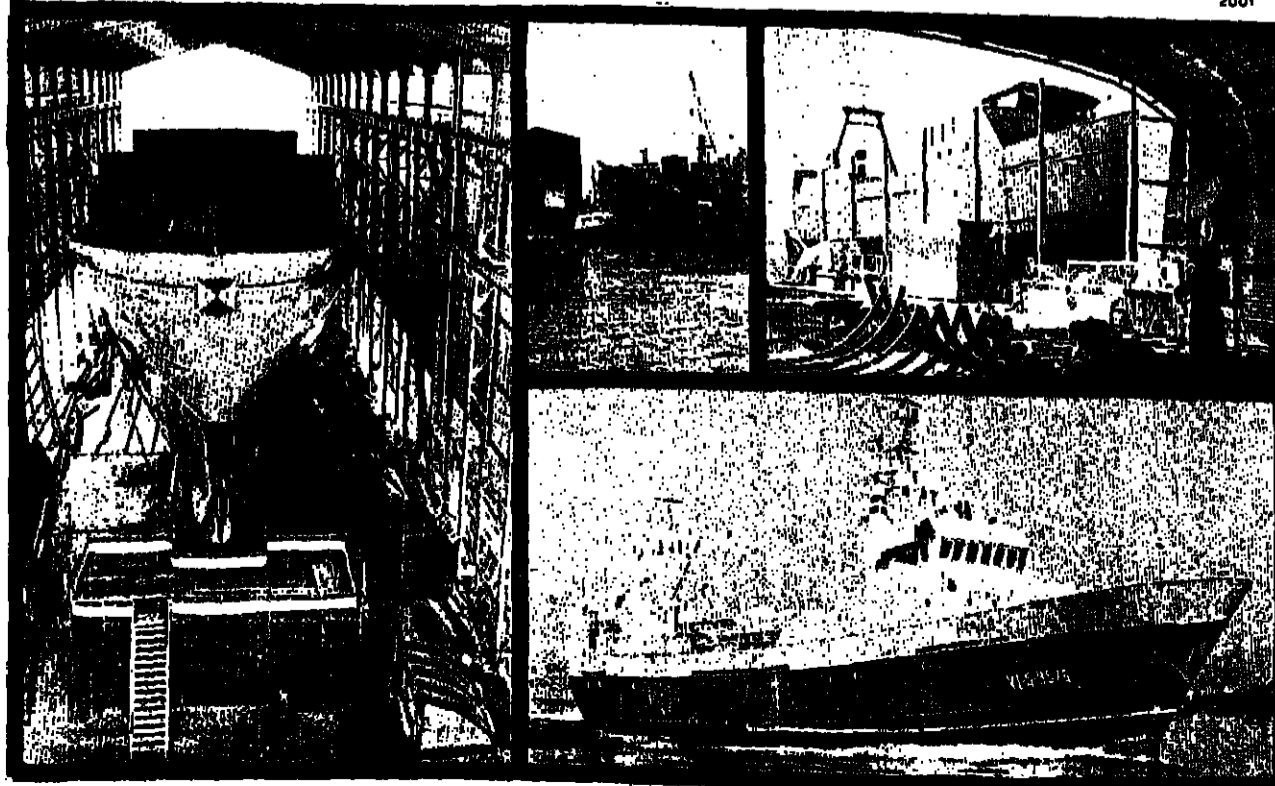
Slipway:
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Breadth: 13 m.
Lifting Capacity: 1,000 T.
Dock Cranes:
2 cranes with capacity up to 12.5 T.
Cranes in Shipway N.º 2:
2 bridge cranes of 20 T.
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Bridge Cranes in Shipway N.º 1:
2 cranes of 10 T.
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FUEL CONSUMPTION (LITERS PER HOUR)

Cummins KT-1150-M 70.8 LPH

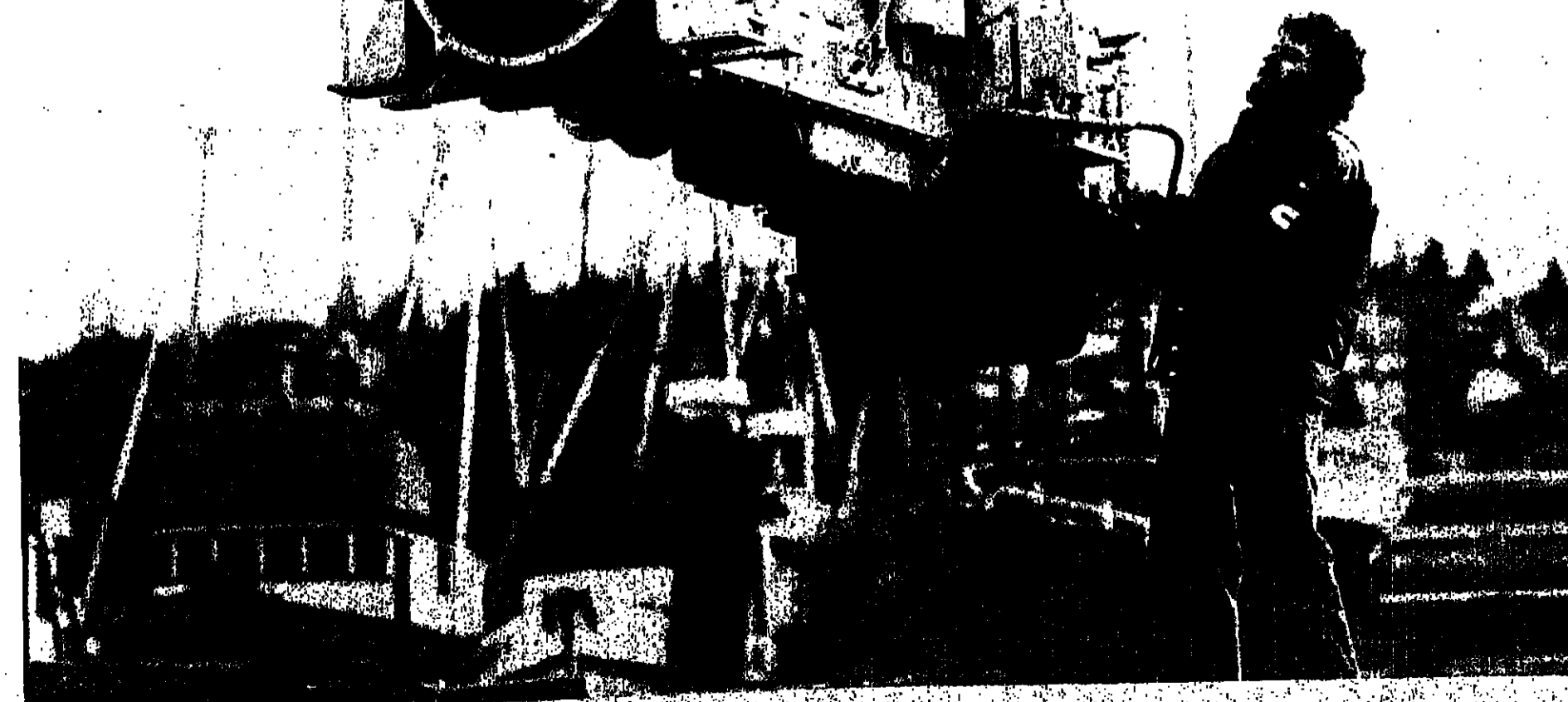
Cat 3408TA 75.7 LPH

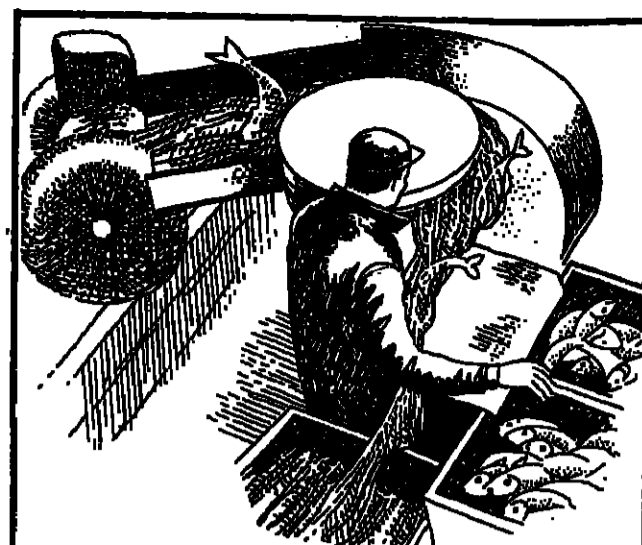
20 40 60 80

*Based on information published by Caterpillar and Cummins concerning fuel consumption of manufacturers' engines under comparable conditions at full load continuous operation.



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Decca ISIS 50 keeps fishing boats working longer

ISIS 50 is the latest machinery surveillance system to be developed by Decca. Simple to install and operate and highly reliable, ISIS 50 offers an alarm monitoring system suitable for all types of vessel to ensure early warning of machinery faults that otherwise could lead to expensive downtime. It is particularly suitable for small ship use in which only a limited number of channels requiring 'on/off' signals need to be monitored and can also be used as a sub-system to more sophisticated ISIS equipment adding still more to the cost effectiveness of Decca marine automation.

With all the trouble-free reliability of other Decca monitoring systems, ISIS 50 provides small work-boats of all types with efficient low-cost machinery monitoring.

- Standardised, modular units enable systems to be assembled economically to match any ship's needs.
- A compact system comprising a control unit and any number of alarm display units - each display monitoring up to five channels - with appropriate time delays.
- Malfunctions indicated by an audible alarm - with outputs for driving klaxons or flashing beacons. First-up alarm facility.
- Complete self-test of the system by means of the Function Test button.
- Meets all the requirements of the major classification bodies also, IEC and BASEEFA.
- Supported by comprehensive Decca service.

Contact your local Decca agent for fuller information about this important development.
Decca Radar Limited Albert Embankment London SE1 Telephone: 01-735 8111 Telex: 28588

Record US Fish Expo features in-water

THE SUPER

RECORD support from suppliers to the industry and record attendances are expected at the 1978 American Fish Expo, which has its showing in Boston, Massachusetts, from Wednesday, October 25, to Saturday, October 28.

This year some 10,000 visitors are expected at a show that will pack the exhibits of more than 300 firms into Boston's Hynes Veterans Auditorium, and feature everything from splicing tools to completely rigged fishing boats.

Manufacturers from many different countries will be displaying a range of fish finding and catching equipment. Displays will also include plant for processing, preserving, packaging and handling seafoods.

In addition to exhibits by United States companies, Fish Expo will present joint stands from the United Kingdom, Norway, Iceland and Canada (Nova Scotia). Individual firms from Sweden, Germany, Spain, Panama, Belgium and Canada will also be there.

Apart from the group stands, other British and Norwegian manufacturers will be displaying equipment on the stands of agents in the United States.

Most interesting of the new features at

Fish Expo 78 is the use of a nearby marina for an in-the-water display of fishing vessels. These will include general-purpose boats, trawlers, research and demonstration vessels ranging in length from 19 to 50 ft.

Once again Fish Expo will have a full programme of seminars and workshops dealing with new catching techniques, seafood processing, navigation, fisheries management, vessels design, aquaculture and other topics.

Over the four days seminars will begin daily at 9 a.m. The boat display opens at 10 and the exhibition halls at 11.

Fish Expo has grown considerably in size and importance during the past few years, due in part to a dramatic change of

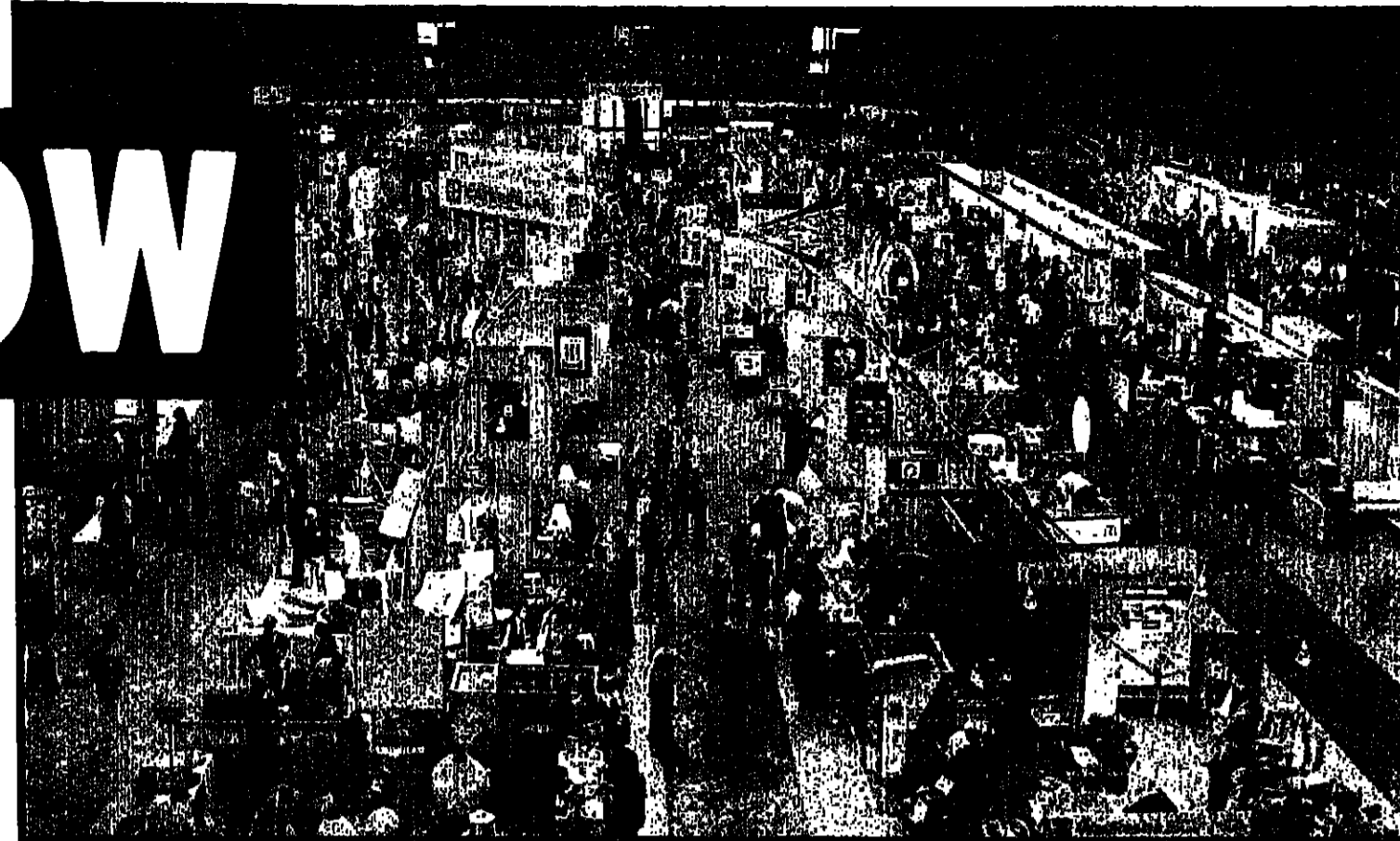
boat display

SHOW

fortunes in the American fishing industry. The showing in Seattle in 1977, for example, was the largest of the 11 exhibitions since it was launched in Boston in 1967.

In New England particularly, the industry had been in a state of decline, a victim of benign neglect by government, investors, manufacturers and general public. But, with 20 per cent of the world's fishing resources now included in America's 200-mile offshore jurisdiction, prospects there have never appeared brighter.

Increased activity is also seen ashore, where plans abound for the development of new fishing ports and processing facilities.



THE record-breaking Fish Expo in Seattle last year: this year's show in Boston should be even larger.

The latest

WHERE
10,000
VISITORS
WILL SEE
THE BEST
IN FISHING

FURTHER evidence of the advances in fish catching and fish finding technology will be found in several stands at Fish Expo 78.

Some outstanding examples will be presented by firms from outside the United States, such as Lasse Hydraulic of Scotland whose new-design hydraulic combined seine winch and rope-drum unit in the 50 ft. anchor seiner *Esnie* is described in this issue (pages 38 and 39).

From the US west coast, Marco will be introducing its TiLiner automated longline system (described in *FNI* in September). Components of the TiLiner will be exhibited.

Also on show on the Marco stand will be a trawl winch, Puretic power block, Capsump, a pot hauler and a side thruster.

Advanced

Krupp Atlas Elektronik is introducing its Atlas Fish Finder 781, claimed to be one of the most advanced fish detection systems now available.

Patterned after the Atlas 700 series, the 781 has six basic ranges from 0-10 to 0-500 fathoms.

A graphic scale expander is included to magnify fish echoes for detailed viewing with three modes - bottom locked, surface locked and mid-water trawl operation.

A fish scope with large daylight tube is incorporated in the equipment.

The 781 works on 33 kHz in conjunction with the high-efficiency ceramic transducer

SW6020. Under favourable acoustic conditions, says Krupp Atlas, large single fish can be detected at about 250 fathoms, fish shoals to 500 fathoms and the bottom to 1,750 fathoms.

Among the equipment which will be introduced by Wesmar of Seattle is its new API100 autopilot. This is designed for use in boats from 60 to 120 ft.

It features an electronic compass with no moving parts which provides instant course information, rate of turn computer for accurate steering, rudder/angle course error, function lights and many other features.

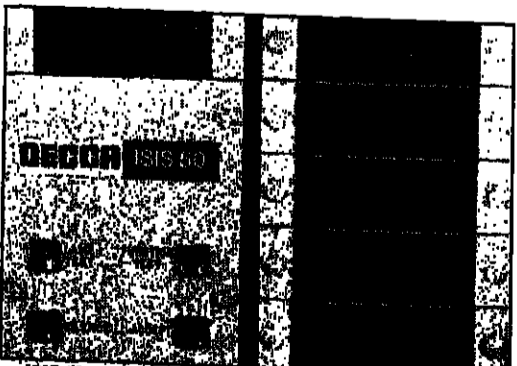
The API100 adapts to hydraulic or mechanical steering systems.

Wesmar will also be showing several of its range of scanning sonars, chart recorders and the new 500SS mini side scan which is used for locating wrecks.

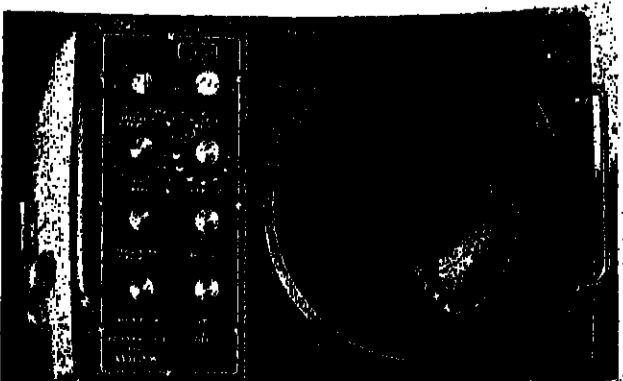
Latest of the firm's sonars is the new SS165 which is claimed to be "one of the most versatile scanning sonars available." It has a maximum range of 2,400 ft. (720 metres)



A typical installation of an ISIS alarm monitoring system in a fishing boat.



**DECCA
MARINE
AUTOMATION**



AMERICAN fish-finding electronics: The new Wesmar SS165 scanning sonar.

for finding and catching

and locates fish through 360 degrees.

Two new features of the SS165 are modulated sweep and digital tilt readout, said to be new to a compact sonar set. Modulated sweep presents fish and underwater obstructions in true range and relative bearing on a ten-inch (25cm) CRT screen. Digital tilt readout provides precise sonar beam repeatability.

Konel will be showing the

new range of large recording fish finders from Furuno in Japan - the models FE-612, 812 and 813.

These are the first in a new series of all solid-state recorders. They will be shown with the ES-5 scope unit featuring bottom-surface lock.

There will also be a Furuno sonar model FH-105, a full line of radars and smaller fish finders, and two new facsimile recorders.

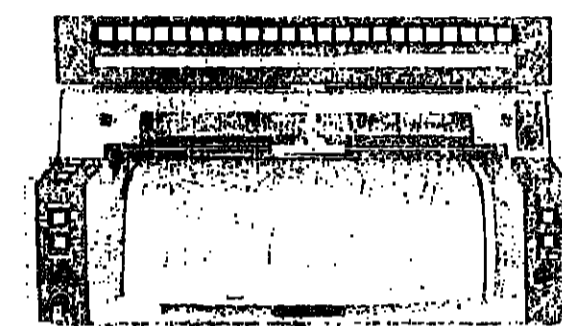
Among the variety of processing and preservation plants which are to be displayed at Fish Expo 78, will be the Carrier Transcold Company's new Dolphin refrigeration system which has been tailored for fishing boats.

Fish Expo is always well filled with much of the best-known equipment in North America for propulsion, for gear handling and for fish finding and vessel navigation.

It also reveals some novel and unusual items.

This year, for example, tucked away in the British group of stands will be the GR Torrymeter. A small electronic instrument developed by the Torry Research Station in Aberdeen to help assess the quality of a fish through its freshness.

The Torrymeter is made in Scotland. It is now in use in 45 countries.



THIS Japanese Furuno FAX-143 facsimile recorder will be shown on the Konel stand.

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not only for such fish as cod, saithe, haddock, whiting and pollack
- but also for herring

The ARENCO SKINNER model CUS is the outcome of experience gained both in development workshops and processing plants.

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The ARENCO SKINNER model CUS offers many advantages

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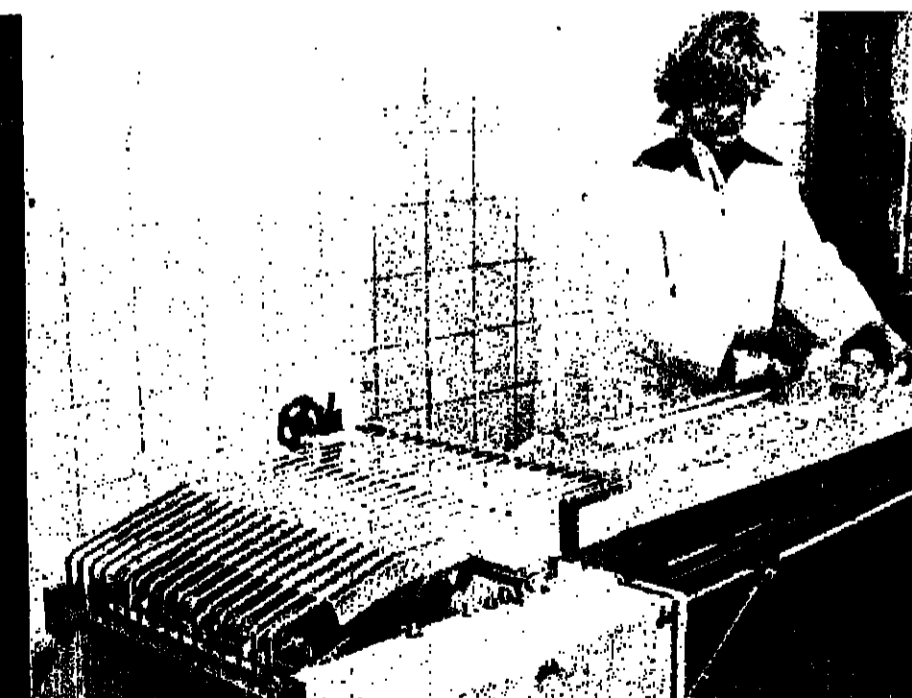
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Please send me literature on ARENCO SKINNER model CUS

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WE ARE EXHIBITING AT
FISH EXPO

Meetings and exhibitions

WHERE IT ALL BEGAN

COLONIAL Williamsburg, the restoration of Virginia's 18th-century capital, will be the site of the 23rd annual Atlantic Fisheries Technological Conference which will be held from November 5 to 8 at the Williamsburg Lodge.

The first AFTC took place in 1957 in Williamsburg. The purpose of the conference is to provide a forum where fisheries technologists can discuss research objectives and methods, exchange research concepts and hypotheses, and present informal reports on researches completed.

From tentative beginnings, the conference has grown to international stature, with past sessions held in most eastern states of the USA and in Canada.

Topics this year will include energy, underutilised species, economics, seafood composition, quality, and nutrition. More than 50 speakers will participate.

Over three hundred people are expected to attend this year's session. Rooms have been set aside in the Williamsburg Lodge, The Motor House.

The necessary forms for papers, reservations, and registration can be obtained from John Long, Secretary, 23rd AFTC, Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, USA.

Norway's fishermen back conservation

THE ANNUAL convention of the Norwegian Fishermen's Association ended in Trondheim on September 8 with a unanimous declaration in support of the conservation policy of the Fisheries Directorate.

But, while recognising that advice from marine scientists must continue to guide official fisheries policy, the governing body of the Association said that the tendency of the experts to make repeated and substantial revisions of

estimates baffled fishermen.

The convention called for tougher enforcement of regulations in the Norwegian 200-mile economic zone. It expressed indignation over violations of Norwegian and former NEAFC regulations by "the other coastal state in the Barents Sea."

It also recommended that reciprocal rights in the national zones be based on value scales.

The Association repeated its call for a 1978 allocation of 20,000 tons of Atlantic-Scandinavian herring.

fisheries would be far less in 1980 than was estimated when the present long-term plan was drawn up.

He said shortfalls must be expected for Arctic cod, saithe, capelin, and mackerel.

Estimates of the spawning cod stock indicate this may be only half that expected for 1980. Capelin stocks have also been severely diminished.

But stocks of North Sea and Atlantic-Scandinavian herring have been building up. If the strict protection measures were kept up, there was reason to hope for gradual increases in these stocks during the 1980s.

Speaking at the convention, Director of Fisheries Knut Vardal warned that the basic stocks of many of Norway's

NOR-FISHING IS SET FOR OSLO

MORE THAN 140 companies and organisations concerned with the fishery industries have now booked space in Oslo's Sjølyst Centre for the Nor-Fishing 78 exhibition from November 20 to 26.

Two seminars will be held in the Centre during the time of the exhibition. The first, being organised in co-operation with FAO, will look at the work to be done in developing countries.

The other will review the Norwegian experience in finding and catching blue whiting. This year, the Norwegians caught about 115,000 of this fish. The seminar will be in Norwegian with interpretation into English.

A three-day visit to Nor-Fishing from Britain is being organised by the Importers' Club (Norway). The inclusive cost for scheduled flights, first-class hotel, bed and breakfast is £166, with single-room supplement.

Participants in this tour depart from London on November 19 and return on November 22.

Further information can be obtained from Importers' Club (Norway), 20 Pall Mall, London SW1.

New Orleans fish meal conference

NEW ORLEANS will be the venue for the 1978 annual conference of the International Association of Fish Meal Manufacturers, from October 30 to November 3.

This will be the 18th, meeting of the Association (it was formed in Madrid in 1959) and it is gathering in New Orleans at the invitation of United States members, Zapata Haynie Corporation and Seacoast Products Inc.

A special feature of the conference will be presentations by US and other

experts on the world protein and animal feeding stuffs markets, and on fish-spotting techniques.

At the 1977 conference, a new feature was a symposium on meal processing designed for association members and their technical advisers and invited equipment manufacturers. This proved highly successful and a further symposium will be held on October 30 to consider effluent control and process automation.

The Association now has members in 16 countries.

US London show

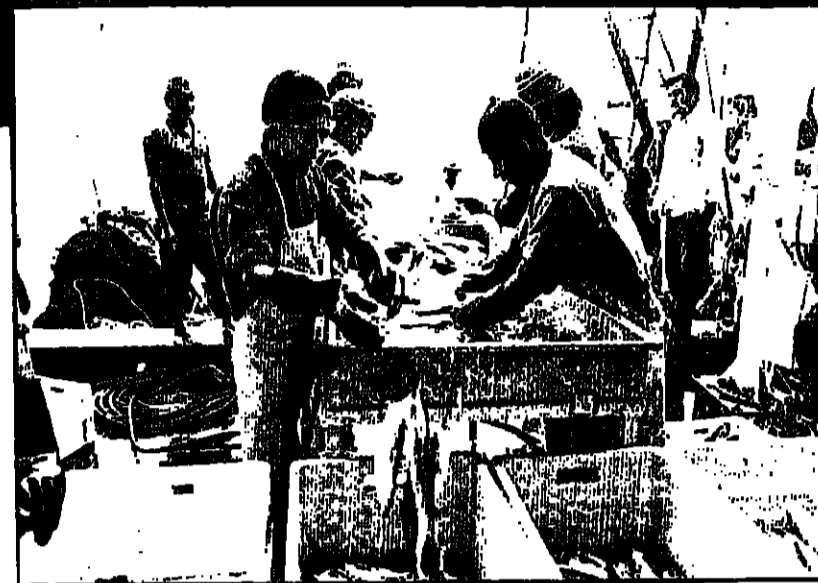
UNITED STATES-based fish companies, looking for export outlets in the British market, will feature strongly in a two-day exhibition of American foods in London on October 9 and 10.

Organised by the US Department of Agriculture, the Food America 78 exhibition will be in the Grosvenor House Hotel.

Among the fish companies taking part are Fairbro Inc.

(Canned Shrimp), Superior Fish Company (cooked Florida lobster, lobster tails, Spanish mackerel fillets, dressed conch, red snapper fillets and frogs legs), Food America Exports (frozen oyster products, canned minced clams), Kennebec Fish Corporation (frozen herring fillets, frozen hake, dogfish, skate wings, monkfish tails), and D. K. Paul and Company (frozen and smoked shrimp).

STATE SELLS PERU'S FOOD FISH PLANTS



Freshly-caught food fish are cleaned and sorted at port in Northern Peru

THE PERUVIAN government is dismantling EPSEP, its food fish division, and is offering its plant to private industry. It is a "magnificent opportunity" for the private sector, said Fisheries Minister Francisco Mariategui.

According to the Minister, recent surveys in Peruvian waters had indicated a stock of 4.6 million tons of pelagic fish.

This included 4.8 million tons of anchovy, 4.6 m. tons of jack mackerel (jurel), 3.7 m. tons of pilchards (sardinas), 1.9 m. tons of horse mackerel (caballa) and 1.6 m. tons of Pacific saury (tagujilla). There is also an estimated 1.2 m. tons of Pacific hake and similar species.

from an
FNI correspondent

meal," said one industrialist. "Nowadays you can earn as much or more by selling five tons of fish."

"The whole industry should be restricted," said another. "It becomes a question of whether you should burn food fish for meal when people need it to eat."

Canners in Peru, like those in Chile, are moving into a period of big development. Processors, including state-owned Pepesca which is up for sale, are finding promising outlets for pilchards. These are scarce in Southern Africa,

Estimates

The estimates are based on a sampling survey carried out in August and many people in the industry feel they are over-optimistic.

But they agree with Minister Mariategui that the food industry offers good prospects. "You need five tons of fish to make a ton of

due to the collapse of stocks off Valdivia Bay.

In Western Europe, the ban on herring fishing has opened new markets. Peru is seen to have an excellent chance of breaking into these and other markets, but the quality will have to improve.

Quality was one of the targets in the state programme to develop the industry which included construction of fishing complexes at Paita and Samanco on the northern coast and at La Puntilla, south of Lima. All of these are now up for sale mainly because the state can no longer afford to operate them.

A group of private investors successfully tendered the equivalent of £1.4 million to acquire the Chalpesa factory which forms part of the Paita complex. They are paying 25 per cent down and the rest over five years.

Formerly owned by Epsep (34 p.c.) and three Japanese companies, Chalpesa went into liquidation in July 1977.

Pilchards

The new company will be known as Del Mar S.A. It will process pilchards, jack and horse mackerel, dogfish, shark and saury.

At Samanco near Chimbote, three private companies have been assigned 10,000 square metres of land each for factories. This amounts to half the total area of the complex, whose port works and buildings have already been completed.

Officials describe the La Puntilla complex near Pisco as a "white elephant," apparently because of insufficient fish in the area.

Epsep has been authorised to sell off boats (of which it has 22) and all its processing plants and cold stores. It is also to sub-let terminals and other units it manages for the Ministry of Fisheries. Staff has been cut from 3,500 in 1975 to 1,480 this year. Further redundancies are expected.

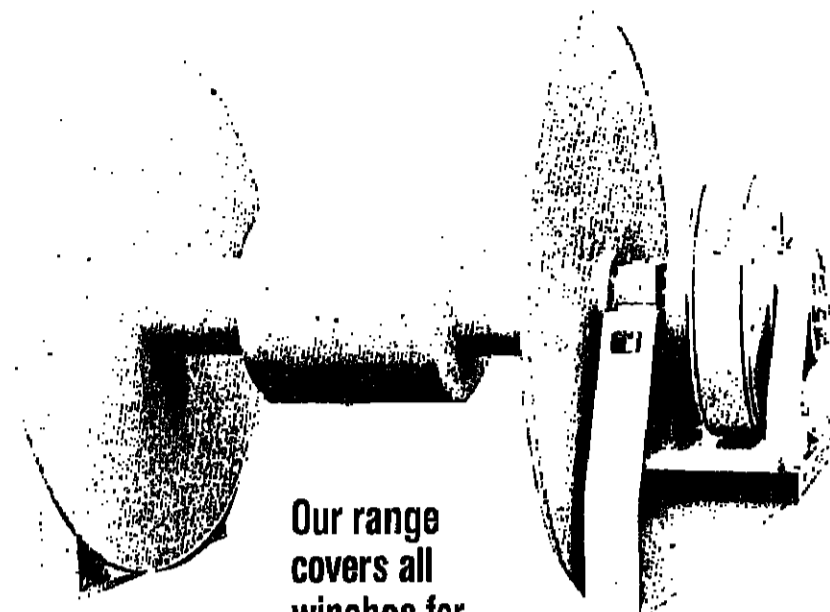
Since the cutback, Epsep says it had a profit of 1.8 million soles in 1977, compared with loss of 309 m. in 1976.

Seaweed scooper

TRIALS have been carried out in the White Sea near the Solovetski Islands of a vessel which the Russians claim is the first to mechanise the labour-intensive process of harvesting blade kelp. Designed and built by engineers in Murmansk and Archangel, the vessel is reported to have a collector-conveyor device which is lowered over the side. A cutter operates at a depth of four to 12 metres and the kelp is brought to the surface by belt conveyor.

The vessel has a crew of three. In one hour it is said to be able to harvest a day's supply for a seaweed processing factory being built near Archangel.

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Iver Christensen introduce their new Midwatertrawl

For faster towing speed the Midwatertrawls are now made with 128 inch mesh (1600mm half mesh) in the wings and first section of belly. The big mesh or the ropes will also help with the jelly-fish problem. The nets are fitted with stainless steel combination ropes for better opening and more stability, and are easy to handle through the power block. This net is presently being used by Danish and Swedish vessels in the Kattegat and Skagerrak waters with great success. The net can be made either for pair or single boat trawling and will be ideal for herring, mackerel, sprat and blue whiting fishing.

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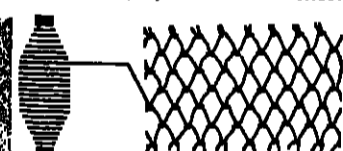
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MODERNISATION of the fishing fleets of a developing country can mean many things. It can be the powering of a traditional canoe by an outboard motor; the replacement of a sail by a simple inboard diesel engine. It can also mean giving a boat the protection of the latest in modern coatings, as this article explains.

HOW ICI IN SINGAPORE

Paints and

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FISHING in south-east Asia is a varied and important activity providing the essentials of a staple diet for millions of people.

Numerous government agencies have been set up to co-ordinate the industry. In Malaysia, for example, the Majlis Ikan acts as a co-operative to assist fishermen in the construction of boats as well as in the marketing of their catches.

The fish are normally caught close to the shore on the coasts of the Sunda shelf in boats ranging from 14-28 feet long. The design of the vessel has not changed significantly over the last few hundred years, but the change from sail to engine power which is taking place has updated the vessels considerably. Although it is a traditional industry and slow to change, more modern methods of catching are being introduced with the customary worry that the sea will be over-fished.

Hacked

During construction, the vessels are hacked into shape using axes from trunks of local hardwoods such as chengai and meranti and planked up onto their frames without the use of templates or drawings. There are still some boats in use which were built with wood dowels instead of metal fasteners. However these are dying out.

After the planking is completed, the seams are caulked with thin cellulose fibres which are the bark of a local tree. In Thailand, old fishing nets or cotton fibre are wedged in between the planks. After the insertion of these fillers the caulking compound comprising tung oil, clays and occasionally lead oxide are mixed together and applied to the seams.

Various types of compositions were applied over the wooden hull; traditional materials were bitumen or a mixture of bitumen and tung oil. Even though the vessels were at sea for relatively short periods of two to three days at a time, they were still fouled on returning to port.

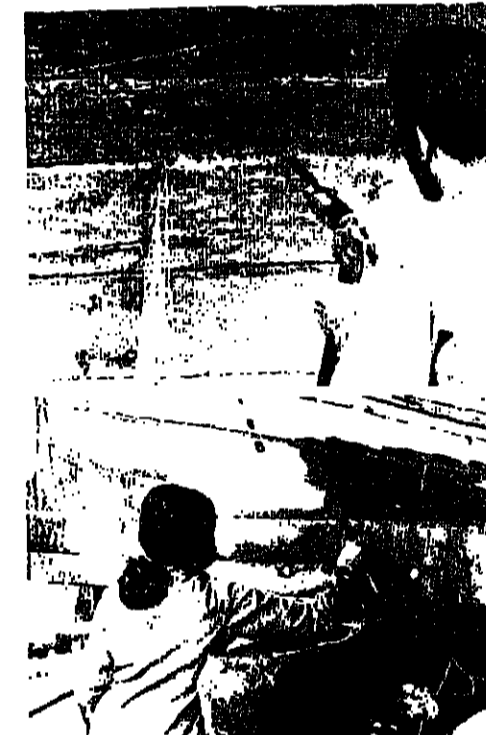
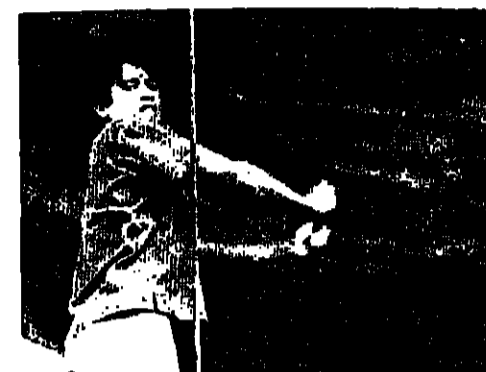
Replaced

Today, very little bitumen is used underwater. Marine paints and anti-fouling compositions have replaced the traditional coatings. In Thailand, where there was a certain amount of American influence, the vessels tend to use more expensive vinyl antifouling. In Malaysia and Indonesia conventional products are used.

To meet the fisherman's demands, ICI Paint companies in south-east Asia studied the different requirements at the ICI regional marine

GAVE THE FISHERMEN WHAT THEY WANTED

progress in Asia



PICTURE SEQUENCE, from the top: First, the old paint and marine growths are scraped off; caulking is done by wedging in old fishing nets; then caulking compound is applied. Finally, the boat gets her protective coating of anti-fouling paint. Two coats are normally applied.

laboratory in Singapore. Then, by carrying out field trials in co-operation with the fishermen, devised different products for different areas. From this work, ICI has been able to establish itself as a major supplier to fishermen for all their paint requirements.

On underwater areas, the wooden hull is first primed with an aluminium wood primer sealer. This is followed by two coats of Fisherman's grade anti-fouling, a conventional copper-based leaching type.

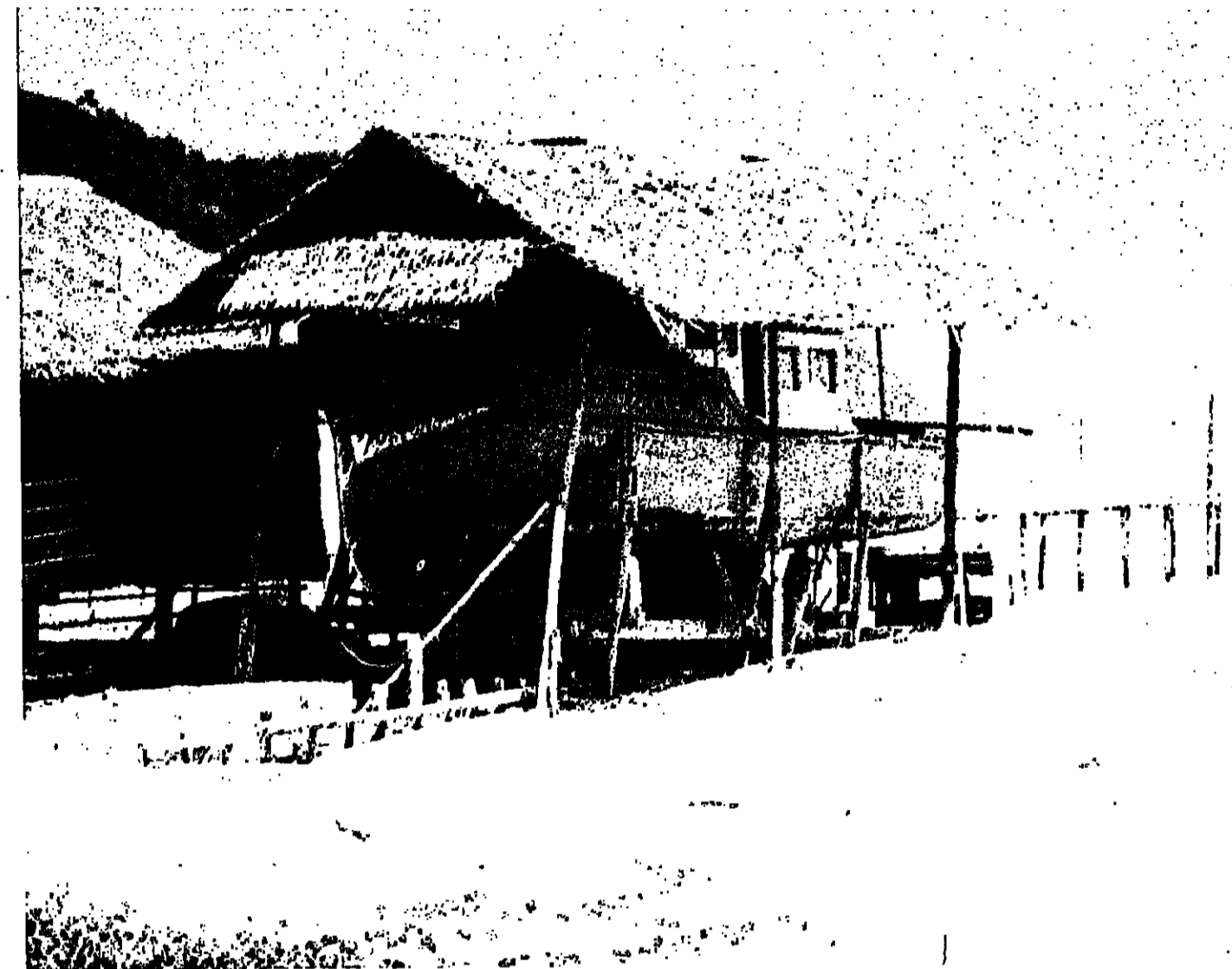
Economise

Although this grade has proved satisfactory, many fishermen are now trying to economise by buying the more expensive Tropical grade and

repainting less frequently. The normal period for repainting the underwater area is four to six months, but in many areas the vessels are beached and re-coated more frequently between tides.

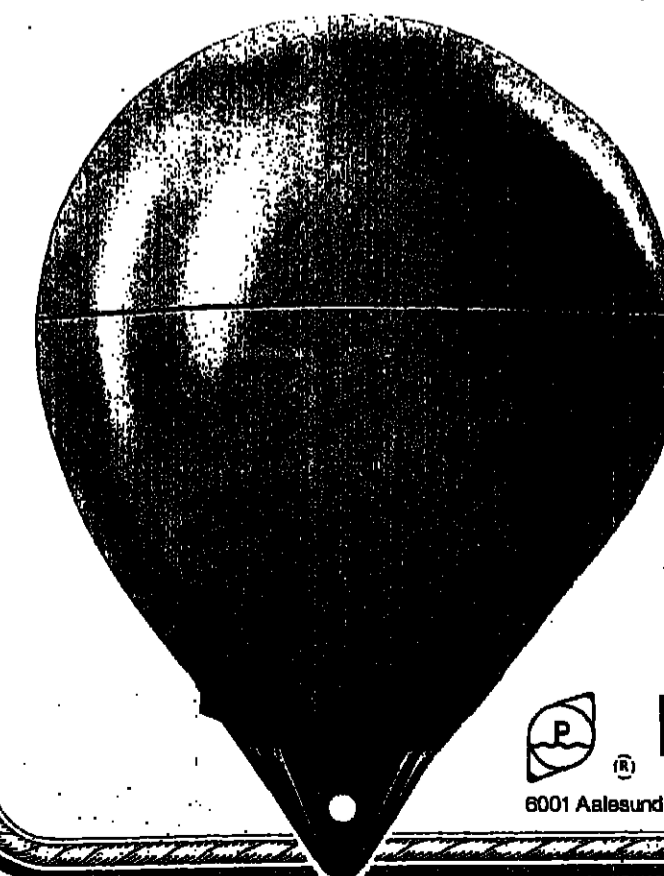
Above water an alkyl gloss finish is used, usually over the aluminium primer sealer and a coat of marine undercoat. Decks are normally left as bare wood.

As mentioned above, vessels in parts of Thailand use more sophisticated coatings. These vessels are mainly considerably larger and relatively new. They also spend longer periods at sea — up to ten days, and are only repainted every 12-14 months when slipped for a general survey. Long-life vinyl antifouling is applied often over the bare wood.



A WOODEN BOAT is slipped on a beach in Thailand for cleaning, caulking and painting.

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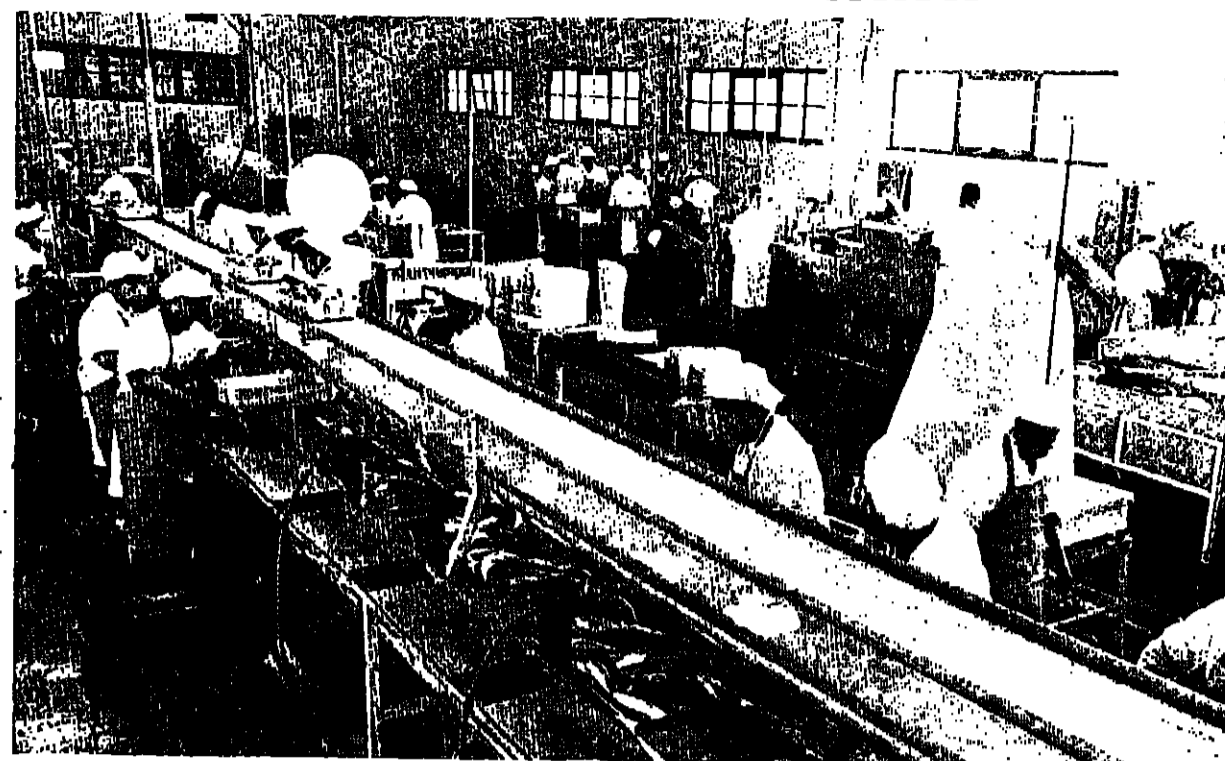
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WHERE IT READS LIKE A WHO'S WHO



HAKE is the main species in this plant in San Antonio.

Chile future

MANY Chileans (and foreigners) have long believed that the future of the country should be sought along its generous coastline. They have said again and again that, adequately surveyed and fully exploited, ocean resources could produce earnings exceeding those from copper, Chile's major export. That possibility may now be on the horizon, reports *FNI* correspondent KENNETH PROUDFOOT.

TODAY in Chile, fishing is an activity offering bright prospects. The list of foreign companies setting up offices and processing plants is beginning to read like a Who's Who of international seafood processors.

Together with new investments by local companies (already in fisheries or from outside), these are moving Chile through a period of considerable fishing industry growth.

One big area of expansion is in canning. Technicians at the Institute of Fisheries Promotion (IFOP) say canned seafood could be greatly improved if the raw material was better handled and processing plants were technically improved and modernised.

In 1977 export sales of

canned seafoods amounted to 4,825 tons and the value rose from US\$2.8 million in 1976 to \$9.5 million. Present canning capacity in Chile is about three million cases a year.

But rising demand for all seafood products and steady orders continue to encourage the growth of installed capacity along the coast. Meanwhile, IFOP, together with other state agencies and several universities, is organising programmes to instruct crews and factory workers how to improve the quality of fish by more careful handling.

For canned seafood production, Chile can be divided into four regions.

NORTH... this has eight factories situated in the port cities of Arica, Iquique, Antofagasta and Coquimbo. They pack jurel (jack mackerel) and Spanish sardines (*Sardinops sagax*).

OF INTERNATIONAL SEA-FOOD PROCESSORS

sees big in fisheries



HAND filleters prepare a catch of merluza (hake)

kerel) and Spanish sardines (*Sardinops sagax*).

In Antofagasta and in Iquique, some canneries process chiglas (mussels) and also have artificial cultivation rafts in the area of Mejillones which offer the prospect of a steady supply of quality-controlled raw material. In Iquique, plants also handle bonito when this is available.

The northern zone has tended to concentrate on fish meal processing and so the canning section has been economically less important. But, by utilising both mackerel and Spanish sardine, canners offer an interesting variety of lines.

Nationally, 75 per cent of all canned fish in Chile is salmon-style jurel. This fish and product is popular with domestic consumers and relatively inexpensive (a 450-gram pack sells for the equivalent of 50 US cents).

CENTRAL... this includes the canneries in San Antonio and Valparaíso. The main fish processing in the region is the freezing of hake and langostinos. In addition, small amounts of shrimp, langostinos and locos (Chilean abalone) are canned, mostly for export.

SOUTH... this zone has about 11 canneries centred in the Talhuano area where the principal line is canned seafood, although there are also several meat plants. The companies can jurel and also another species of sardine known scientifically as *Chupea bentincki*.

The above three zones depend primarily on industrial fleets for their raw material. The fourth zone, in the far south, gets most of its fish from small-scale fishermen working tiny boats and dependent on weather conditions.

In this zone are Puerto Montt, Calbuco, Chiloé, Puerto Aisen and Punta Arenas. There are some 20 companies processing seafoods. While the zones to the

north, concentrate on finfish, these southern zone plants handle mariscos (shellfish) — clams, locos, mussels, king crab (centolla), sea squirts (piure), razor clams, sea urchins (erizos) squid (calamares) and others.

Although the installed capacity of these plants is relatively small, most of them are planning expansion or have already up-graded older equipment to boost production during the few months of good weather suitable for harvesting shellfish. They are also improving quality controls as more of their production goes to export markets.

Big gains

Chile's seafood canning industry is expected to register substantial gains in volume over the next five years.

The domestic market for canned fish and shellfish has been fairly stable. But the recent rise in canned seafood imports has begun to turn the market round. It is giving the Chilean consumer new meal-time serving suggestions and local processors some unexpected competition.

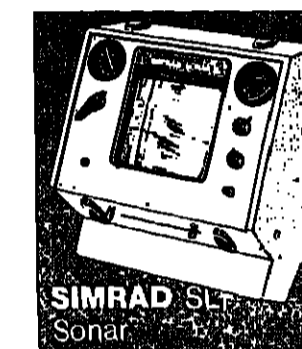
Chileans have been finding that canned seafoods from Spain, Germany, Scotland, the United States, Argentina and other countries offer them more variety and higher quality, often at around the same prices as local products.

Now, some of the more market-oriented processors (such as Camelio) are responding to the challenge. They are speeding-up modernisation and are increasing the variety of their packs.

Chile's low labour costs presently give the country a small edge over competitors in many world markets. With additional mechanisation and great volume, they should be able to maintain a comfortable lead. But more machinery will be needed, larger plants will have to be built and fleets expanded.

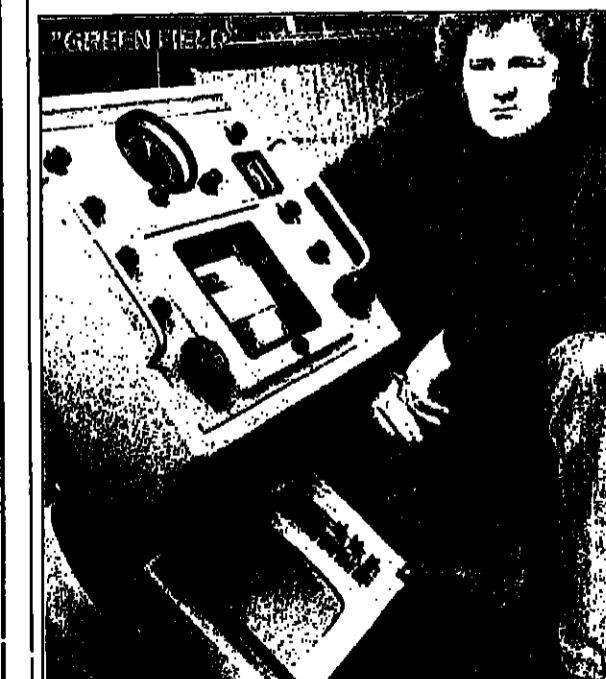
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BY FAO

TWO workers at a plant in Calbuco label a pack of shellfish.



The all-rounders

Simrad SQ4 and SL sonars together with the new CQ Sonar Scope offer: ■ Long range detection ■ Excellent definition of MACKEREL, HERRING, PILCHARDS and SPRATS.



It has been said that mackerel could only be seen on high frequency sonars. This has been proved wrong, particularly by Mr. Tom Stevenson of 'Green Field' and Mr. Alan Nicholson of 'Pescoso II'. The alders of 'Green Field' and 'Sedulous' were also among the first to detect mackerel on their SQ sonars at 1200 to 1750 m. and other fish at the full 2500 m.

Mr. Stevenson (SQ sonar) is very impressed with the large CQ scope. Its memory store gives a steadier picture, making it easier to determine the size, shape and direction of the shoal. "A lovely picture" he said, "a big advance on existing scopes. It gives good returns at 2500 m., with mackerel at 1250." He also liked the master/slave facility and very short ranges provided.

Mr. Nicholson was the first to try out a modification to the SL sonar which greatly improves fish detection, especially mackerel. "I'm very pleased with this" he said "I'm getting mackerel at 1500 m. by day and 500 by night." He was also delighted with the new CQ scope, particularly the definition, master/slave facility which saves paper, and the offset arrangement.

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Screw presses work best on a firm fibrous feed. If the fish are of inferior quality or of a species having little or no fibrous meat, the press must be operated at reduced capacity.

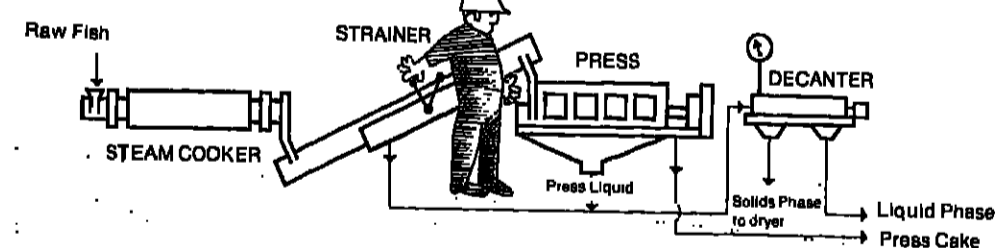
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GATHERING shellfish near Puerto Montt in southern Chile.

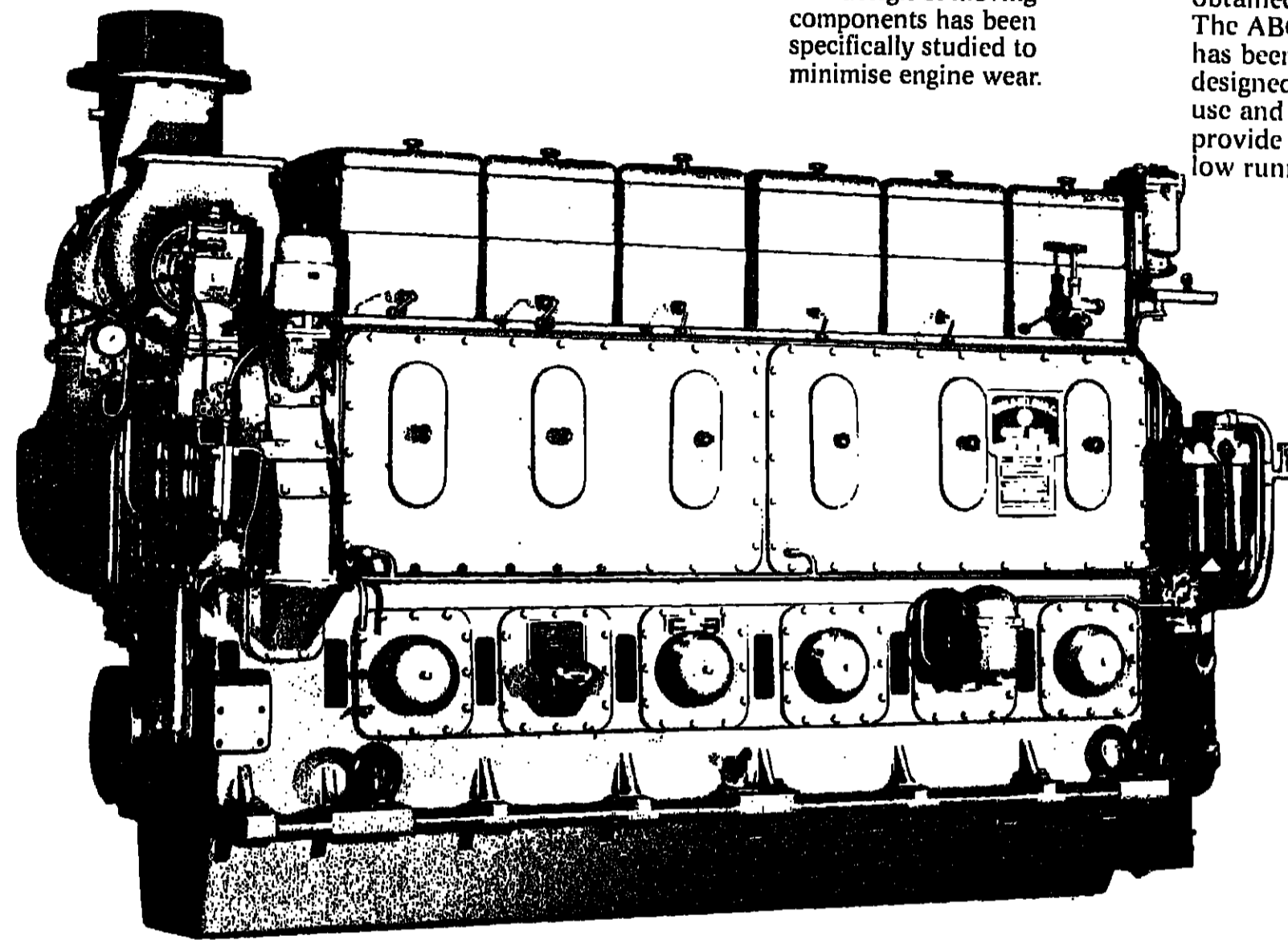
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There's more to them than meets the eye.



The 6MDX engine

Very low engine wear characteristics
The design of moving components has been specifically studied to minimise engine wear.

Medium speed
Maximum power is obtained at 750 rpm. The ABC MDX engine has been specifically designed for marine use and therefore will provide reliability and low running costs.

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We claim to be the lowest of any engine within our range.

Good fuel consumption
Average 162 grammes per horsepower/hour with all accessories fitted.

Very low noise levels
The material mass correctly positioned absorbs a considerable amount of noise.

A dry sump
Ensures correct lubrication of all working parts which results in a longer interval between services and less engine wear.

ABC marine propulsion engines.

Some things about ABC engines you can see at a glance.

The superb design, for instance, for easy maintenance and servicing. And the precision engineering, which makes for ABC's unrivalled reliability.

But there's a lot more to them than meets the eye. Things like their incredible economy, remarkable quietness of operation, excellent torque characteristics—all this means superb value for money.

In addition there is a comprehensive after-sales service, with trained technicians available for routine servicing or in the unlikely event of a breakdown.

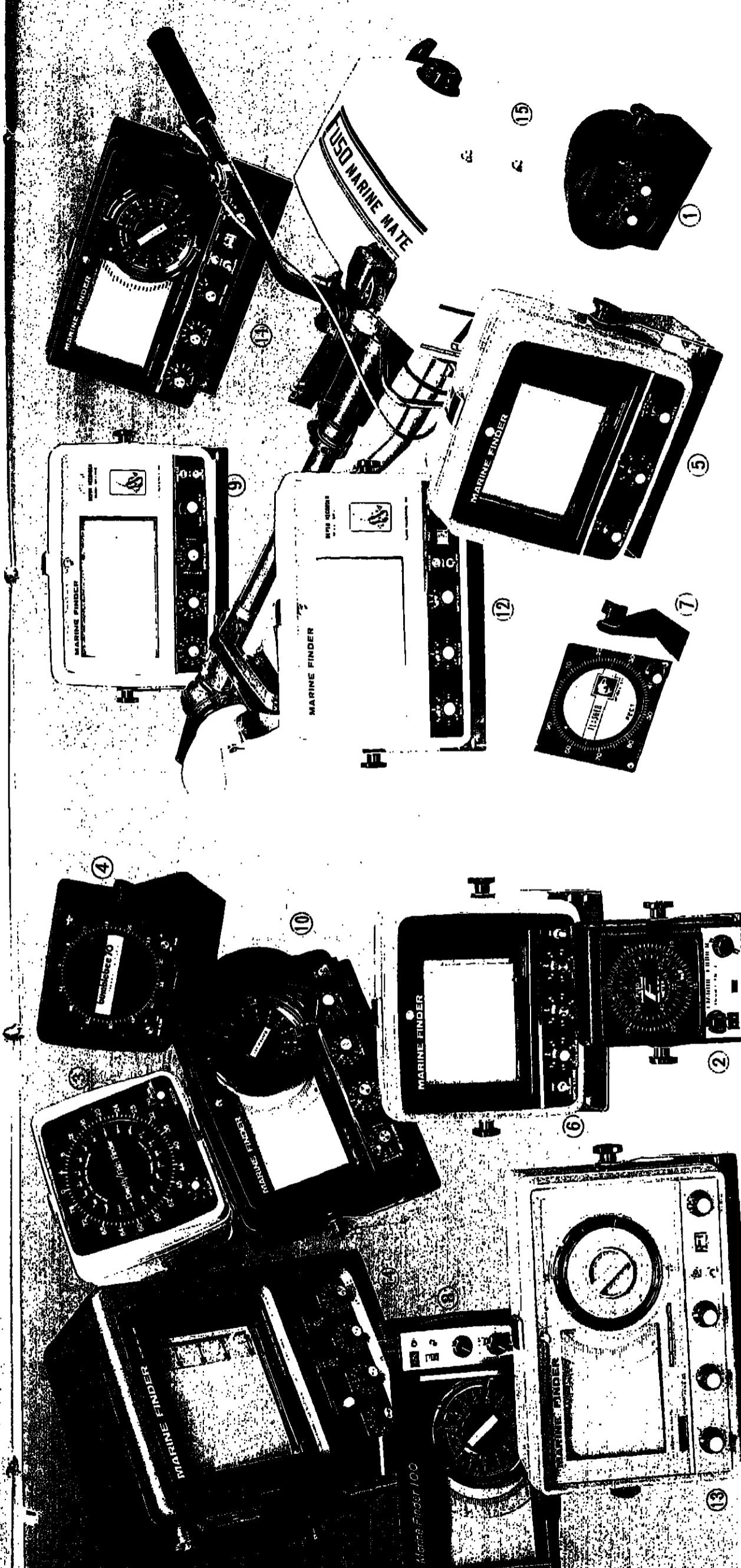
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There's a lot more to them than meets the eye.

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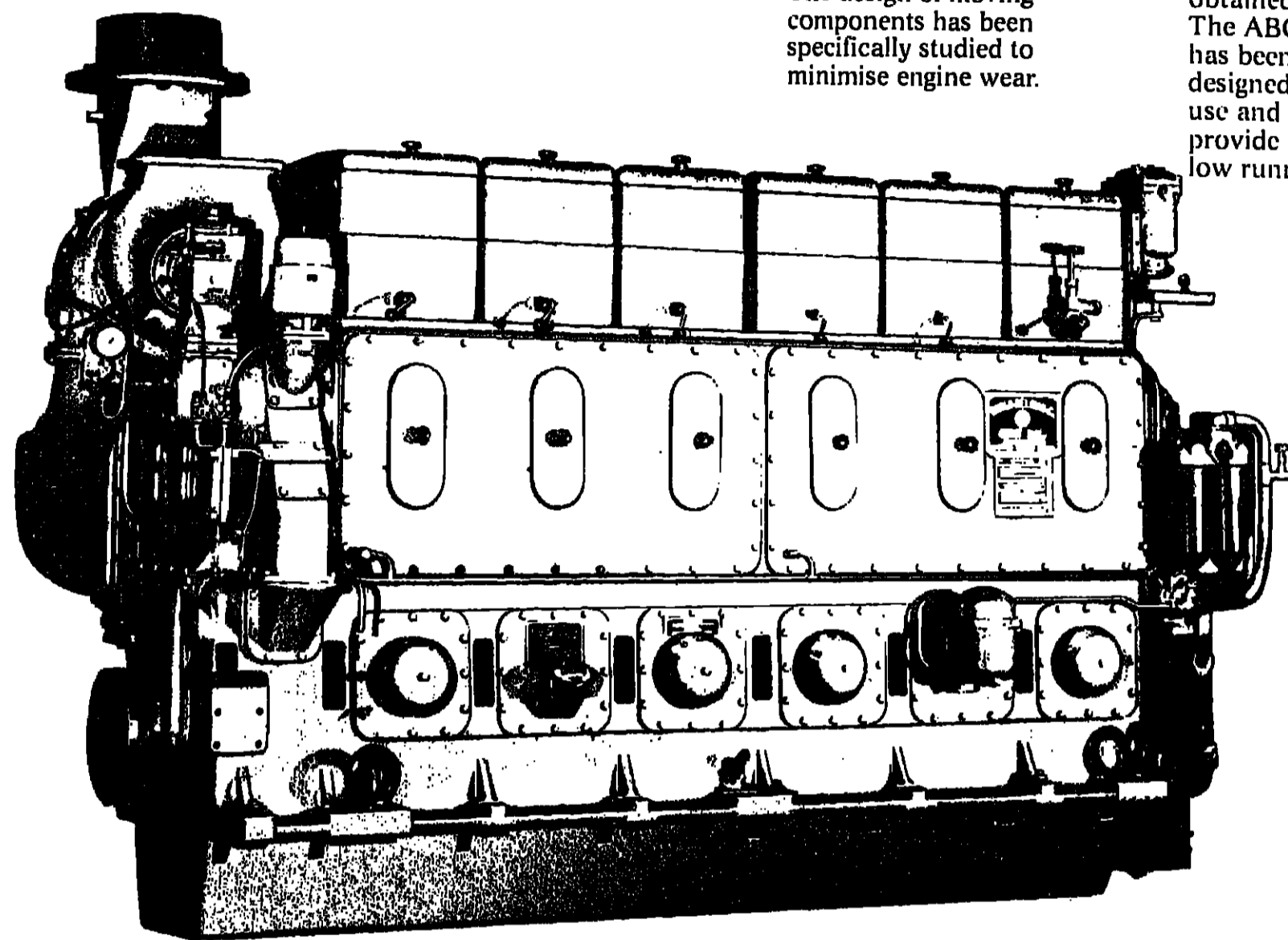


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15. **MODEL FOB-25**
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The design of moving components has been specifically studied to minimise engine wear.

Medium speed
Maximum power is obtained at 750 rpm. The ABC MDX engine has been specifically designed for marine use and therefore will provide reliability and low running costs.

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SEA WORLD STARS START NEW INDUSTRY



A sea lion does a balancing act... and a killer whale soars out of water to delight of Sea World audience.

Soaring high, a dolphin hits the tether ball.

MANAGEMENT realised that something had to be done or the performers would eat up the profits at Sea World, San Diego, California, amusement park where the show stars are dolphins, killer whales, penguins and sea lions. They pack the seats with paying customers but they also eat from \$60,000 to \$70,000 worth of fish every month.

So, to cut the feed bill, Sea World is going into the fishing and processing business in California and Mexico.

Born at San Diego's Mission Bay, Sea World has spawned twice. There are now Sea World marine amusement parks in Aurora, Ohio, and Orlando, Florida.

The parent company, Harcourt Brace Janovich, has bought a three-acre processing site in the Los Angeles harbour and will lease it back to Sea World.

Since the plant expects to quick-freeze 50 tons of fish a day and Sea World needs only

—by an—
FNI CORRESPONDENT

50 tons a month, the company will enter the seafood marketplace and sell to other buyers.

It will also supply its chain of 18 Cap'n Kid's fish and chips outlets, including one at each of the Sea Worlds.

President David DeMotte said Sea World has committed \$300,000 to the Mexican joint venture in developing modern fishing and distribution methods in Magdalena Bay, about 200 miles north of the tip of Baja California on the Pacific Ocean.

Traditional start to the hunt for a delicacy

THE "Lampuki" season started in Malta with the traditional blessing of boats, trawlers and crews, at the island's largest fishing village, Mursaxlokk.

In this old traditional religious ceremony which launches the season, the village priest rides a boat and goes around the fleet anchored in the bay blessing the craft, locally known as "luzzus."

Controlled

The lampuki season is strictly controlled by the government, which also establishes by ballot the exclusive areas where each fisherman will be allowed to fish for the lampuki. The wholesale and retail prices are also fixed by government officials.

According to the Ministry of Fisheries, a total of 148 fishermen have this year

applied for a permit to fish for the lampuki, a migratory Mediterranean species and perhaps Malta's most popular fish delicacy.

Officials

The first nets of each fisherman are cast by government officials on Armed Forces patrol boats to ensure that each boat fishes in the right area. This also avoids quarrels between fishermen and poachers.

This year, for the first time, the lampuki season will be longer than the usual three months. It used to last until November but owing to the frequent good weather in the following months, the season has been extended until January.

This extension will give more rights and protection from "amateurs" to the bona fide fishermen, who mainly depend on lampuki and swordfish for their living.

In 1980, the mermaid of Copenhagen welcomes the world fishing and marine industry.

For visitors and exhibitors alike, the Bella Center in Copenhagen will be the centre of the world fishing and marine industry in June 1980.

Presided over by the Famous Mermaid of Copenhagen, the World Fishing Exhibition '80 will cover every aspect of international fishing and marine activities. It will be a meeting place for the entire industry.

The World Fishing Exhibition covers the whole spectrum of the commercial fishing industry: ships and equipment for the finding, catching, and processing of fish at sea as well as every aspect of the land-based industry including processing, packaging and marketing. It will also include marine products.

The last event in Halifax, Canada, attracted exhibitors from 14 different countries, and 25,000 visitors from 41 countries. The 1980 exhibition will undoubtedly exceed even this record participation.

Both visitors and exhibitors alike will enjoy the magnificent facilities of the Bella Center, one of the most sophisticated exhibition complexes in the world, and the largest in Northern Europe. Only minutes away from the port where boats may be exhibited. It is located midway between the centre of Copenhagen and the International Airport.

And Copenhagen itself is a superb setting for the 1980 World Fishing Exhibition. One of Europe's busiest traffic intersections, in the busy link between Scandinavia and the Common Market, it has all the support facilities to match this major international event. The world-famous Tivoli Gardens, superb after-business dining and entertainment facilities, and the largest hotel capacity in Scandinavia make it the perfect choice to be the centre of the world fishing and marine industry in 1980.

The World Fishing Exhibition 1980
The Bella Center, Copenhagen
2-9 June 1980

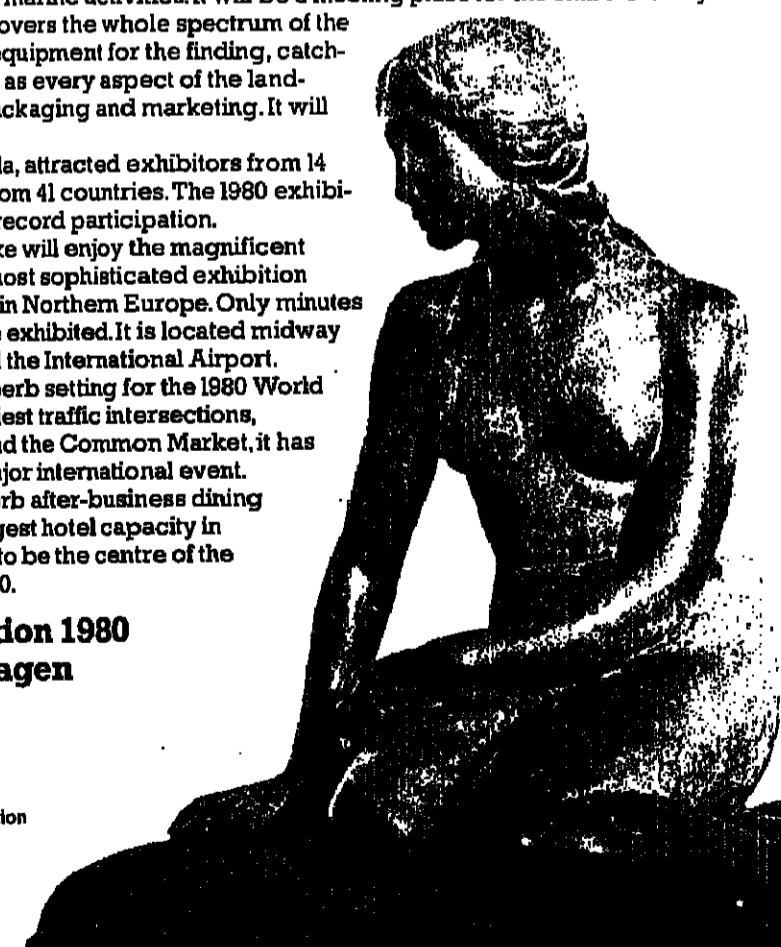
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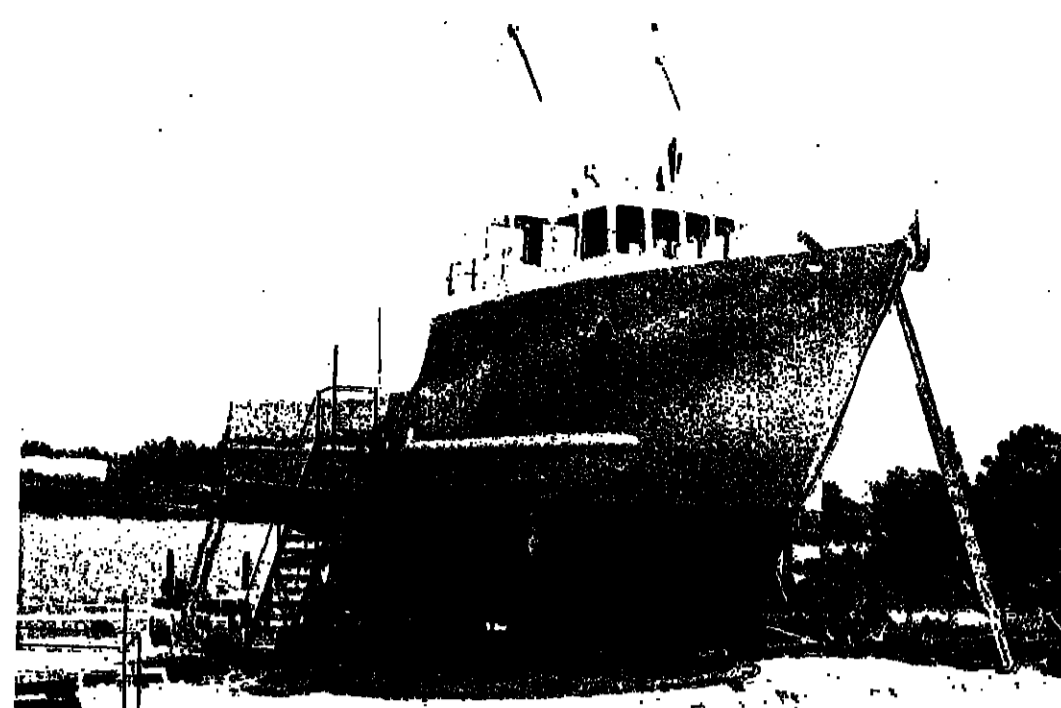
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The *Southern Night*, near completion at Eastern's old yard.

by J. A. FISHER

SINCE 1975 the United States Gulf of Mexico shrimp industry has been experiencing a boom. Landings and prices are up. In the past two years, ex-vessel prices were very high several times, up to \$5 a lb for large-size shrimp.

At times like these, vessel construction activity accelerates too. Such is the case in the Gulf. And a share of it is being taken by small yards building quality boats with that personal touch.

Almost everyone in the fishing industry has heard of yards like Desco in St. Augustine, Florida, and Bender in Mobile, Alabama. But how many know of St. Marks Marine or Phelps, both in Florida? There could be a new trend in the boom — fishing boat construction by the small yard, emphasising custom quality.

If you want a good example of these steel boatbuilding yards along the Gulf Coast, look at Eastern Marine. Located in Panama City, Florida, the company is producing a compact but functional trawler designed to meet the needs of the fisheries there.

Fast start

The man in charge of Eastern is Brian D'Isernia. When you get to know him, it's clear why Eastern is off to such a fast start.

D'Isernia did not start in the industry in a conventional way. He first took an undergraduate degree in economics and then a law degree at Fordham in New York. He migrated to the US New England Coast where he acquired his fishing education. He quickly fished and financed his way to vessel ownership and to a partial share in a Massachusetts based dealership, Seafood Distributors.

One thing always bothered

him. Most fishing boats had too many flaws or bugs which tended to magnify at sea. To him, the solution was clear — design and build his own vessel.

Late in 1976, D'Isernia organised Eastern Marine and began the *Mary D*. The 26.5 metre (88 feet) steel boat was sold for use in the black cod fishery on the US Pacific Coast before it was completed. He began a 29 metre boat and sold it immediately to another California black cod fisherman.

Eastern then built a 21 metre Gulf shrimp trawler which was delivered to the Cook Fish Company early this year.

All extras

The *Lady Grace* is powered by a GM12V-71. She has all the Eastern extras that are earning them a reputation for quality fishboats — deep draft and keel, 2.5 by 1.5 m shoe the length of the keel, rolling chocks, full forecabin, back gouged welds, abundant bracing, 0.8 cm deck and hull.

How the personal touch is helping the little yards in the US Gulf shrimp boom

asphalt bridge planking laid only on a primed surface, steel barred windows, and much more.

Eastern boats even have a varnished, wood-finished galley, which gives a comfortable "back home" feeling.

Eastern Marine began with three men but now has a crew of 52. S. E. Schupps of Mobile, Alabama has done all of Eastern's design work. The stock line now includes four basic trawlers — 20.6, 22.4, 26.6 and 28.4 metres.

Six boats

At present Eastern, has six boats underway. Four are in various stages of construction. Two are almost complete for delivery.

These two boats will go to the Perera brothers of Ft. Meyers, Florida. The *Captain's Pride* and the

Southern Night are identical vessels. Each is powered by a GMV12-71 diesel. They are equipped with GM 271, 20 kW generators and have 110V - 32V light systems. Wagner hydraulic steering and Rheem air conditioned and wood panelled quarters and galley are also included.

Steel deck

The hull and working decks are five-sixteenths inch (about 0.8cm) steel with slightly less on the foredeck and forecabin. Both boats are 23.6 metres (78 feet) long.

Underway are four other boats. Two 28.4 metre vessels are going to the west coast cod fishery. A 24 metre hull is for Gulf Coast shrimping. And a 22.4 metre stern dragger is being built for Rhode Island.



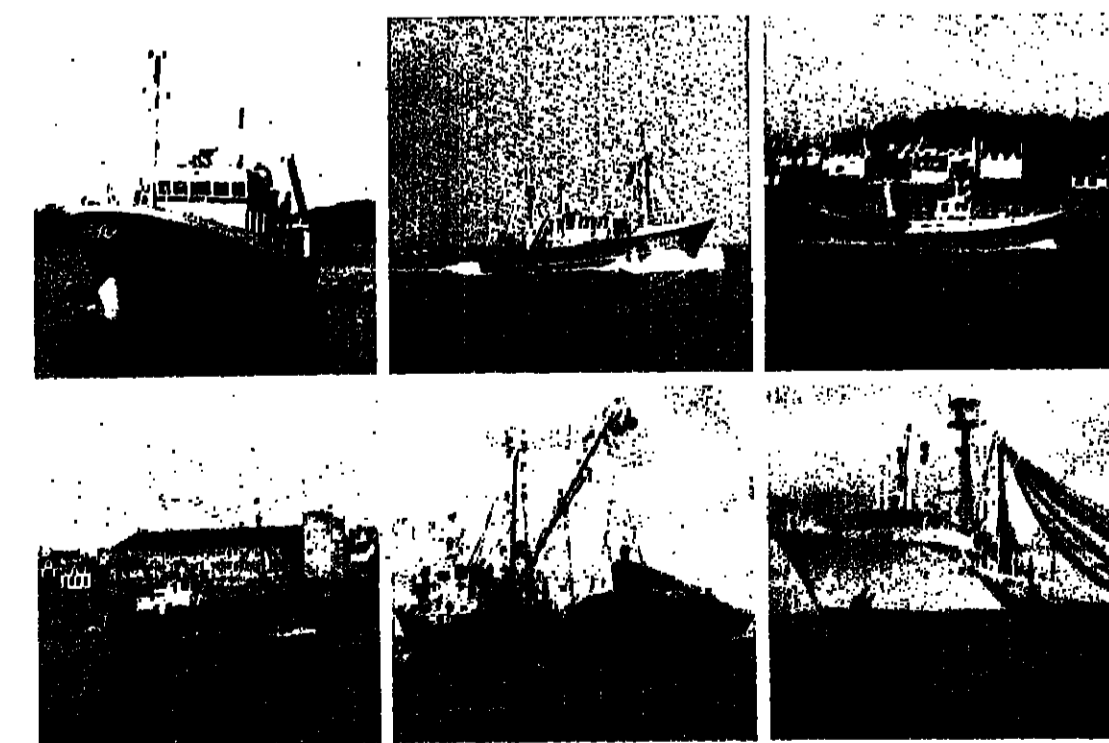
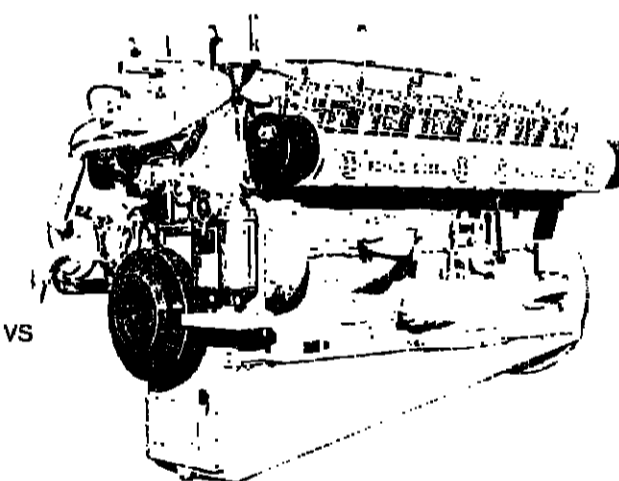
The 78 ft (23.8 metre) long shrimp trawler *Captain's Pride* fitting out in the Eastern Marine wet dock. With her sister boat *Southern Night*, she will fish out of Ft. Meyers in Florida.

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BUSY TIME FOR SERIES BUILDERS...

DESPITE the success of a number of small builders, it is the large yards turning out standard hulls in series that continue to supply United States shrimp fishermen with the bulk of their new vessels.

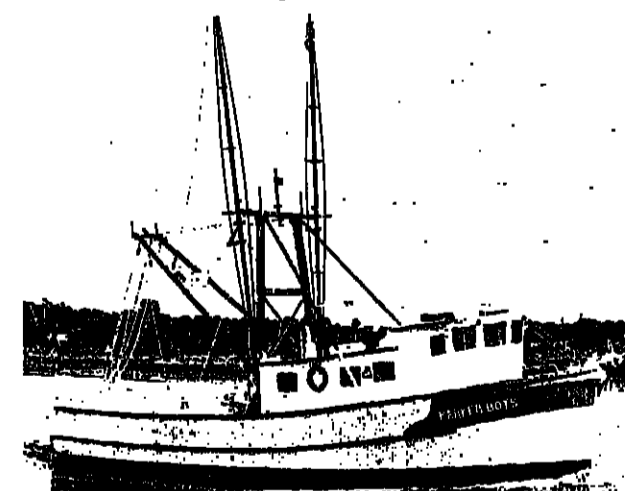
Typical of these are the *Parker Boys* and *Lady Betty*, two standard types recently delivered by Desco Marine of St. Augustine, Florida.

The 68 ft (20.9 metre) long *Parker Boys* is a Desco GRP and wood vessel with a fish hold capacity of 1,742 cu ft (49.3 metres). She was built for Parker and Sons Inc. of Ponte Vedra Beach, Florida.

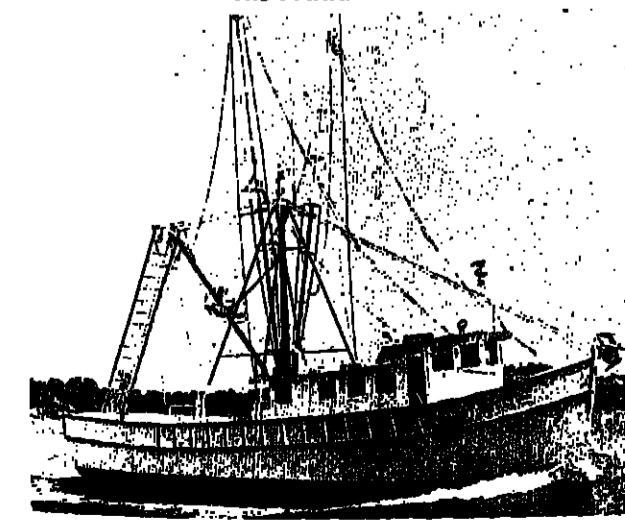
The main engine is a Caterpillar 3408 diesel developing 365 hp and turning a Columbian fixed pitch 62 by 48 inch propeller through a Twin Disc 6 to 1 reduction gear. She has a McElroy 504 winch.

Built for Donald J. Verret of Bon Secour in Alabama, the *Lady Betty* is a Desco standard 73 ft (22.26 metre) long wood boat with a fish hold capacity of 2,080 cu ft (58.9 metres).

She has a Stroudsburg 520D winch and is powered by a Cummins TK1150-M 365 hp engine turning a Columbian 64 by 46 inch propeller through a Capitol reduction gear.



The PARKER BOYS



The LADY BETTY

SALMON SALES GROUP SET UP

TROUT and salmon farmers in Norway have set up their own sales organisation.

The Fiskeriloppetrettenes Salgsag A/L is based in Trondheim. It will have sole first-hand sales rights to the fish produced by its members. It will also have the right to set prices and to regulate production and turnover.

The production of farmed fish in Norway now amounts to about 4,500 tons a year. Salmon accounts for 2,800 tons and rainbow trout 1,700 tons.

This output has a first-hand sale value of 150 million kroner (over £15 million).

A fishery where no-one is satisfied!

THE International Pacific Salmon Fisheries Commission (IPSPC), which regulates the lucrative Fraser River fishery, has to wear kid gloves while trying to do its job effectively.



Trollers in Vancouver harbour. During summer they sat over rich shoals of sockeye salmon but were not allowed to fish.

LES RIMES on the squabble for salmon in British Columbia

There's always somebody who is dissatisfied with its decisions.

Its main job is to divide the catch 50-50 between United States fishermen and Canadians and, at the same time, regulate catches so that sufficient spawners can proceed up the river to perpetuate the fishery.

But there are other considerations: it must allow for catches by Indians who fish the upper stretches of the river to provide food for themselves. And it has to keep a balance between fish caught by trollers, gillnetters, and seiners.

During the summer, the Indians and the federal fisheries department almost went to war when officials ordered that the Indians must stop fishing to allow the sparse escapement of spawners to reach the spawning grounds.

Indians argue

The Indians countered by arguing that they should not be cut off because of poor management practices. They also argued that before the white man came the rivers were not polluted and there was an abundance of fish for everyone.

Fisheries officers alleged the Indians were not only catching fish to feed themselves; they also were catching fish to sell to the public.

As that problem faded away, at least temporarily, a new problem arose with the troll fishermen. In early August, the rich Adams River run of sockeye salmon was stalled, because of warm ocean currents, off the west coast of Vancouver Island where the trollers were fishing — and the troll fishermen were in a position to reap a rich harvest.

But the fisheries officials closed the area to them!

Officials claimed too many fish might be caught off the west coast, upsetting the balance. The fishermen, on the other hand, felt that if the fish were in a location for the troll fishermen to catch, they (the fishermen) should be allowed to catch them. And they accused the officials of regulating the fishery to benefit the major fishing companies.

While many of the fishing vessels are privately owned, many of the big purse seiners are financed through the fishing companies. In the eyes of the troll fishermen, Canadian officials wanted the purse seiners to reap the harvest — so that the mortgage-holding companies would be assured of getting their loans repaid.

For decades, the purse

seiners have been complaining about the gillnetters — and the gillnetters have countered with complaints against the seiners.

The purse seine fishermen own enough boats with enough efficient gear to catch the entire harvest of salmon along the British Columbia coast. They say theirs is the most efficient way of fishing — and what is the most efficient is also the most economical.

Yet, often, the purse seine fleet has to stay outside an inlet, or bay, while gillnetters are allowed in to make highly-lucrative catches. And some seine vessel owners claim that, while the gillnetters are making bonanza catches, they are also losing fish, because fish left too long in a gillnet will "drown" and drop out of the net, dead.

Since more members of the United Fishermen & Allied Workers Union are gillnet members, the union tends to side with them against the purse seiners.

Thus, the Indians are complaining they are not getting their adequate share of the limited Fraser River sockeye runs. The trollers are complaining they are not being allowed to take their adequate share. The seiners complain because of what they allege to be wastage by the gillnetters. And the gillnetters say the seiners are too big and too efficient.

Meanwhile, all the commercial fishermen are upset by the sports fishermen who, they say, are taking too large a share of the catch. They are particularly resentful of some United States tourists who visit Canada each year in their caravans and "commercially" can over-the-limit catches, returning to their homes and selling their choice Canadian salmon to their neighbours.

Campfire songs

To compound the problem, the Canadian fishermen often find they are unable to tie up to a government wharf, because the entire berthage is occupied by US yachts whose owners are sitting on the beach around a campfire, cooking "over-the-limit" harvests of clams while singing "America the Beautiful".

In this milieu, the IPSPC is putting data into computers and bringing out figures to ensure that sufficient salmon are allowed to escape the trollers, the gillnetters, the seiners, the Indians, and the tourists to reach the spawning tributaries of the river. At the same time, the IPSPC is having to see that the catches are shared equitably by Canadian fishermen and US fishermen, otherwise there could be the making of an international fish war.

COMPUTER TO HELP BIG UK FLEET OPERATOR

CALEY Fisheries Ltd., of Peterhead, Scotland, has ordered a Philips Data Systems Computer costing £14,000.

The firm was founded in 1935 and acts as agent for many fishing vessels in and around Peterhead.

"We form partnerships with many fishing vessels owners and handle all administrative aspects of the boat," explained James Brown, company secretary. "As part of the Associated Fisheries Group, we act for a large fleet of vessels based in Aberdeen, Buckie, Fraserburgh, Peterhead and Ullapool accounting for a large proportion of the total fishing fleet being operated in this region."

"As well as the fishing vessel aspect, we

also have a large chandlery department and a subsidiary company called Caley Oils, which distributes fuel oils not only to the fishing industry but to mainland businesses as well, including farms."

Caley Fisheries' investment in the fishing industry has grown very rapidly in the last four years. With 80 staff and a diversifying operation, Mr. Brown found it difficult to obtain relevant management information.

"Using our mechanical and manual accounting system," he said, "I could not see the necessary facts and figures at the time they were important."

"The computer is necessary to revolutionise our accounting procedures and speed up basic routines as well as provide important management statistics."

Cochin gets new harbour

INDIA'S Minister of State for Shipping and Transport, Chand Ram, opened the first stage of the fishing harbour at the south-west coast port of Cochin on September 8.

This Rs35 million (about £2.2 million) project is the first of its kind in Kerala state, main centre of India's important shrimp export trade. The harbour has been designed to hold 80 deepsea trawlers, 900 mechanised boats for working coastal waters, and a large number of sail-powered country craft. It has a wharf 360 metres long.

Where trawler crews can earn £15,000 a year

DECKHANDS aboard Dutch trawlers earn nearly £15,000 a year, Cork District Court was told last month when ten Dutch owners claimed £168,450 from the Irish government over the arrest of their boats last year.

The claim, arose out of the detention of the Trawlers in Cork harbour for 5½ days in April 1977. Rory Conway, solicitor, making the claim gave the following breakdown.

Harbour dues

Harbour dues and pilot fees £500; Agency fees £375; Expenses of three owners who travelled to Cork for the trial £1,250; Cost of bank guarantee for the trawlers £6,250; Wages for crew members £61,875; Lay-time (cost of keeping the vessels in Cork, overheads, etc.) £98,000.

The Irish Government Order extending limit provisions for its fisheries unilaterally was declared illegal by the European Court of Justice last February.

Court ordered

Mr. Conway said that the original case had been referred to Luxembourg, where the court held in favour of the Dutch owners. The Luxembourg ruling ordered that the trawler owners be paid costs and that the District Court in Cork should fix these.

Mr. Cor Vrolijk, one of the owners, told the court that Dutch crew members on trawlers could earn between £14,000 and £15,000 a year, working 250 days. There was a crew complement of about 17 or 18 men in each boat.

ISRAEL BUYS SARDINE

THE CANNING industry in Israel has undertaken to buy the entire local sardine catch at prices 32 per cent above those paid in 1977.

Over the past two seasons, catches have amounted to only 300 tons a season, compared with the usual 1,200 tons. Israeli fishermen say this is due to competitors from the Gaza strip who, they allege, are using modern, improved nets which enable them to pull in around 700 tons a season.

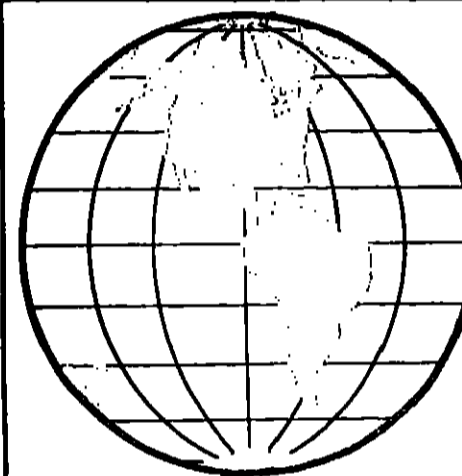
Airship patrol for fisheries

A NEW airship, the AD 500, is nearing completion at Cardington base in England.

It is intended mainly for fisheries protection and oil rig work, and for patrolling coastal zones. There will be a two-man crew, and the airship will be able to carry 2½ tons of freight or ten passengers.

Propulsion will be by two Porsche six-cylinder air-cooled petrol engines, each developing 200 hp. Top speed is 115 knots, and the airship has an endurance of more than 20 hours at 56 knots.

Instead of aluminium, the gondola is made of a reinforced plastic. The use of advanced technology and construction methods will enable series-built models to be sold for about half the cost of similar machines built by conventional methods.

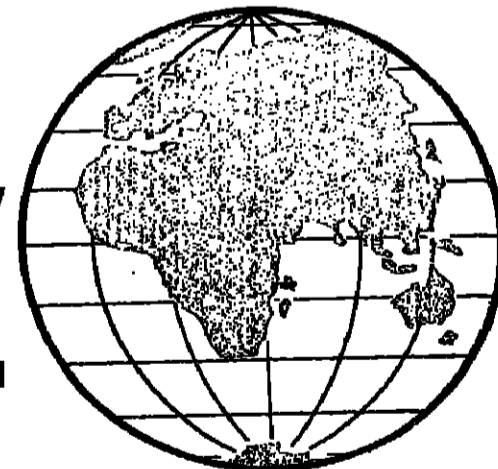


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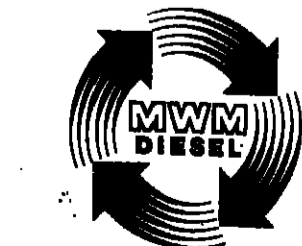
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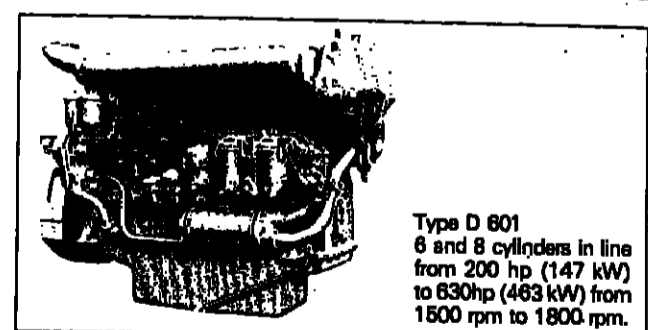
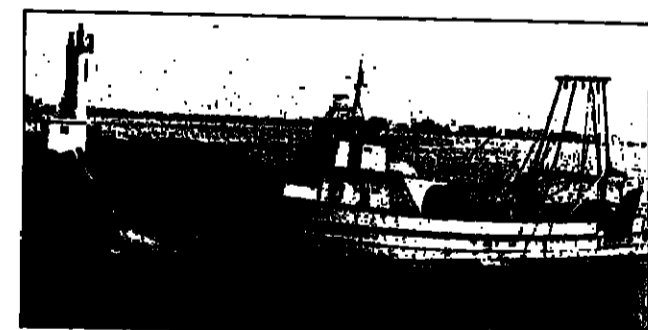
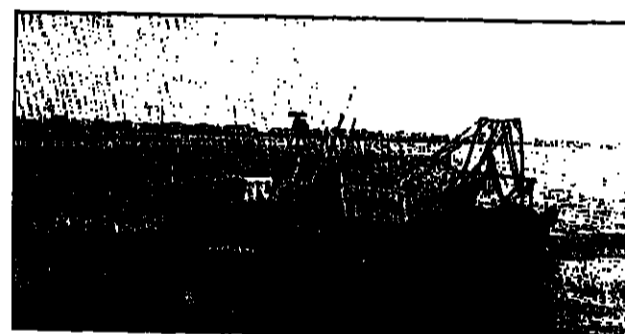
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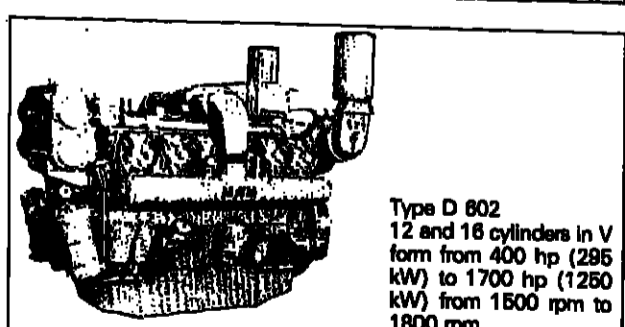
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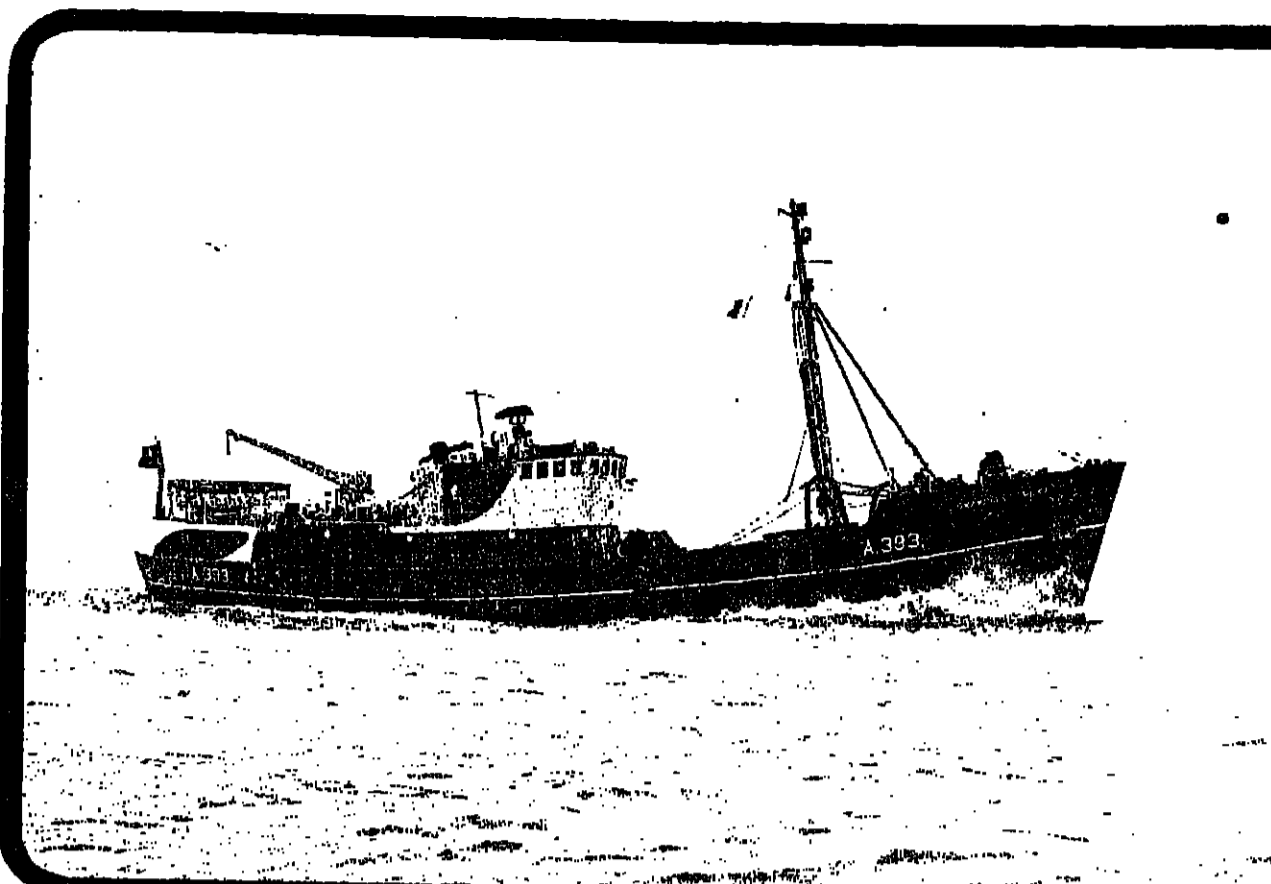


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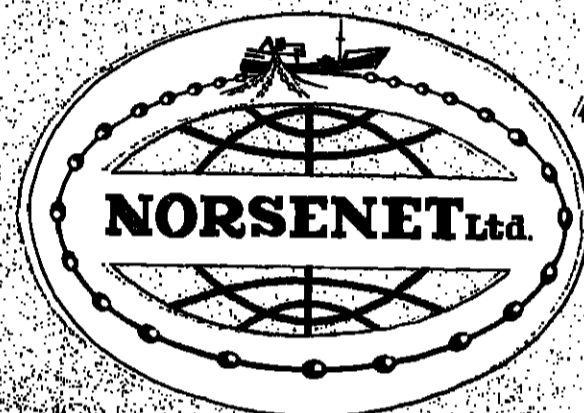


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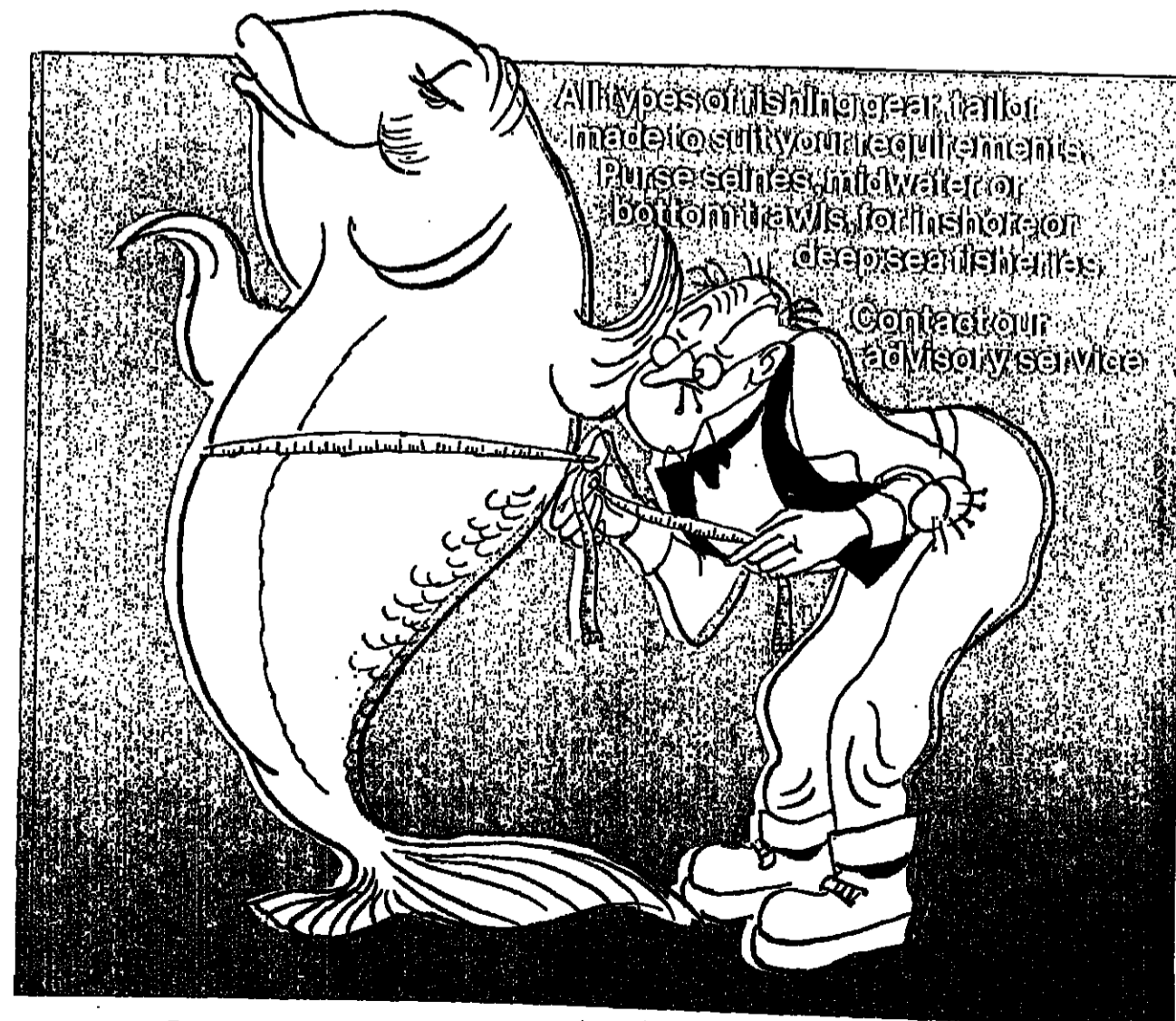
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AS A SECOND

Scots

A SECOND Scottish fishing vessel is to go autolining and it could be the beginning of surge into this method of catching. The ship is the 115 ft. (35 metre)-long, diesel-powered side trawler *Grampian Crest*. Behind the project is a consortium of four partners, backed by the Highlands and Islands Development Board.

The Breasclete Fishing Company Ltd., with a share capital of £100,000, has been set up to run the venture, which will supply a new drying factory on the Isle of Lewis in the Outer Hebrides of Scotland.

Two Scottish skippers, Alex Anderson and George Barclay of Anstruther, are among the four partners. There is also George Craig and Sons Ltd. of Aberdeen, owners of the *Grampian Crest*, and Lewis Stokfisk Ltd., a company jointly established by the HIBD and Norwegian interests to run the drying factory.

Conversion of the ship will be carried out by the Wood Group of Aberdeen. She is expected to begin supplying the factory, at Breasclete, at the end of October.

Encouraging

Since then, 20 to 30 vessels in Norway, Iceland, Canada and the Faroe Islands have had the autoline system installed with encouraging success.

The greatest advantage of the system is that the vessel can shoot and haul gear at the best fishing periods of the day, usually dawn and dusk, with about three times more hooks shot.

Using traditional methods, Scottish line fishermen have usually gone after high-priced quality fish such as halibut, cod, and large haddock. With the autoline system, they could be in a position to pursue more prolific species such as ling and tusk.

Species needed

These are among the fish required by Lewis Stokfisk. The company was formed by the HIBD jointly with A/S Knut Stoknes of Alesund. It is introducing a new fish drying operation in the factory which the HIBD has just completed at Breasclete. Its product, stokfisk, has

ration of fishermen involved.

There was a similar situation in Norway. Then, in an effort to make line fishing methods more attractive and less of a drudgery for the crew, Norwegian manufacturers and boat designers began to work on automatic systems. These have been a long time evolving, but they were much assisted when the Norwegian government sponsored the building of a special ship equipped with the Mustad system.

First vessel

The first Scottish autoliner, the 114 ft. (34.75 metre) *Anni Elisabeth* (owned by the Macleod family of Stornoway) has made several successful trips since having the Mustad autoline system installed in Norway earlier in 1978. She will also supply the Breasclete factory.

Aged 48, Skipper "Eck" Anderson is one of the youngest of the East Fife skippers brought up in the tradition of manual longlining.

Line fishing was once a large section of the industry in Scotland, particularly on the east coast. But with the growth of trawling the method declined and only five vessels now operate using the traditional methods. These involve hand baiting and no one in the industry can see it surviving the present gene-

Stormy time

CANADA'S two west coast weather ships *Vancouver* and *Quadra* — take turns patrolling off Station Papa, 500 km off the British Columbia coast. They send weather information and storm warnings to coastal stations which, in turn, broadcast the data to fishing vessels.

But the Federal government now has announced it is going to phase out the weather ships in about two years' time; and fishermen are worried that they won't be able to receive storm warnings, reports Les Rimes from Vancouver.

Fishing boats hit

Acting regional director of the Atmospheric Environment Department, Mr. Frank Williams, said: "The ability to forecast storm development in the time

SHIP IS CONVERTED...

move into autolining

Consortium is formed for dry-fish plant on Lewis...

markets in Scandinavia, the European Continent and Africa. The preferred species is white ling, but the factory also requires blue ling, tusk and saithe.

The second partner in the Breasclete Fishing Company, George Barclay, is well known as a skipper in trawl and line fishing in Scotland.

Trawler firm

The third partner, George Craig and Sons, is a long-established fishing company. Although involved in trawling and oil support operations, the company's principals have family connections with the longlining side of the industry. For them, involvement in the autolining development is also an updating of earlier techniques.

Commenting on the project, Rear Admiral David Dunbar-Nasmith of the HIBD said the partners had a wealth of experience

appropriate to helping establish the potential for autolining techniques.

"We have great faith in their skill and expertise," he added, "and we are sure they will demonstrate very clearly the possibilities for the future. It is heartening too that they have decided to pass on their knowledge by offering training berths in the *Grampian Crest*."

Experienced line fishermen from the Scottish east coast will provide most of the *Grampian Crest* crew of eight. But island fishermen around Scotland interested in learning the new techniques will be able to join as trainees — a pattern already established by the Stornoway-based *Anni Elisabeth*.

ahead for BC

frame 12 to 36 hours will be hurt the most. This will mostly be a danger to fishing and other slow moving ships.

A spokesman for the Federal Fisheries Department agreed that fishing boats would suffer most.

"If fishing boats are not in a position to get the offshore weather forecast there will be an effect," he said. "But, if there is work to be done and dollars to be made, the boats will go out. They would be taking more of a chance of running into foul weather, however."

The weather ships are said to be top-heavy. They have had to have concrete dumped in the holds and some of the deck gear was not installed for fear of increasing the top weight. The ships also have to use expensive helium for their weather balloons because highly-explosive hydrogen tanks could not be stowed in the ships' holds.

WARNING ON GROWTH IN NORWAY

NORWAY'S Prime Minister Odvar Nordli has warned that there are limits to the future expansion of his country's big fishing industry.

Speaking at a Labour Party meeting at Kvalsund in Finnmark, he said the government's Long-term Programme for Fisheries had been drawn up along four basic guidelines:

- Fisheries policy must be adapted to exploit the potential of marine resources.
- It must be developed in the light of its significance for certain areas of the country.
- People in fishing must be guaranteed incomes comparable with those of other industrial sectors.

- Catches must be so exploited that there is optimum coverage of the world's nutritional needs.

The most difficult task in the domestic fisheries policy, said Mr. Nordli, was to ensure the balance between the fishing fleet's capacity and production, and the available resources.

Soon, the Norwegian government will appoint a committee to examine all aspects of its concessions policy in the fisheries so that it can get a full view of these problems and seek the best solutions.

Mr. Nordli saw the establishment of a 200-mile zone in many ways clarifying the situation in this international industry and creating a better foundation for the years ahead.

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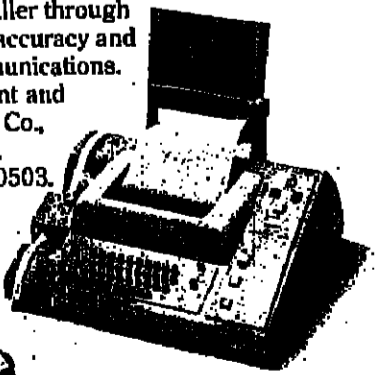
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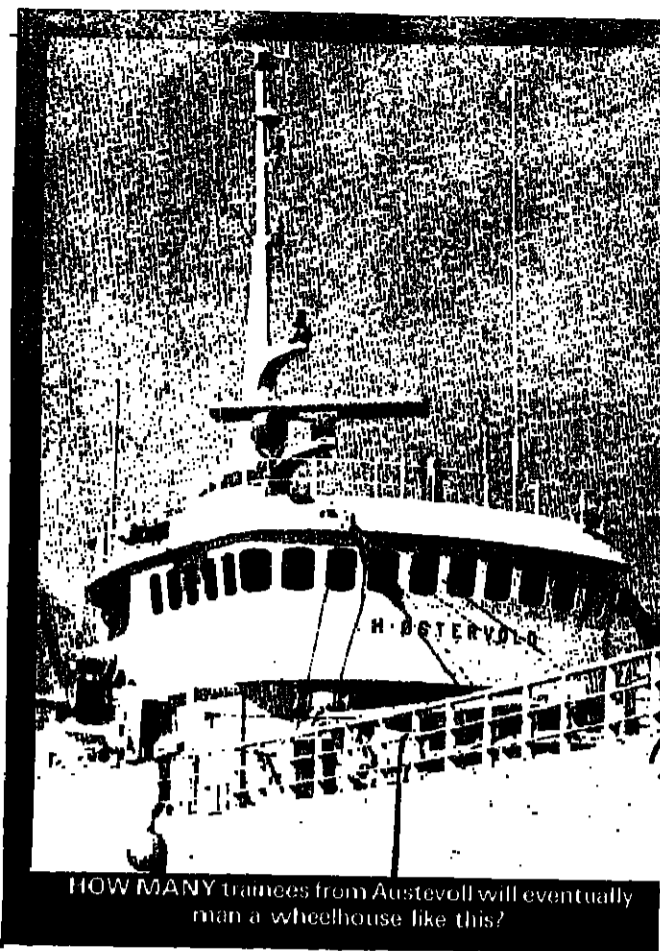
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training at AUSTEVOLL



HOW MANY trainees from Austevoll will eventually man a wheelhouse like this?

THE NEWEST of Norway's five training schools for fishermen was opened in August at the important fishing port of Austevoll, on the west coast, south of Bergen. Costing 6.6 million kroner (about £650,000), the new centre has been relocated from cramped quarters at Laksevaag.

Any Norwegian seeking a career in fishing and who has completed the national nine-year primary education, can apply to attend the school. Candidates for fishermen's certificates get free board and lodging and home travel during the holidays.

With its teaching staff of eight, the school can take 70 trainees.

Above the basic fisherman level, there are more advanced courses leading to qualifications as skipper or foreman. The latter involves intensive work on various kinds of catching gear and instruments.

The basic curriculum is divided into three subject groups: fishing gear, nautical subjects and fish finding equipment, and catch techniques and fish handling.

There are also five hours a week of basic science, including oceanography and marine biology and two hours of electives for a 35-hour week total.

This course, lasting one year, also qualifies for the 2nd class skipper examination.

To get the fisherman ticket, an additional 12 months of practical work in a fishing boat is required.

This period of supervised and regulated work is intended to give all-round training aboard a modern boat. Progress is registered in a personal log that follows the candidate throughout the course.

A fisherman can also earn his ticket without taking the courses by completing three years' practice.

Another year of systematic training at sea and a one-year course can lead to the fishing boat skipper certificate. This requires an examination and a total of 42 months' practice.

Instruction concentrates on navigation, theory of ships, and sciences with English, book-keeping, fishery law and additional work on fishing gear and methods among the required subjects.

An alternative leading to qualification as net man is half-year of instrument training and instruction, emphasising the construction, function and operation of the trawl. With 12 months practice on a trawler, this gives the status of foreman.

The entire training programme for fishermen has been revamped in recent years and has not yet attained a permanent form, says school principal Erik Rosenqvist. A more rigorous curriculum for prospective skippers has been urged in order to give them a more thorough knowledge of the behaviour of ships.

From 1979 the Austevoll school, will also offer training in aquaculture. The farms are already developed and run by personnel from the Institute of Marine Research in Bergen.

There are plans to acquire two training craft: a 50-60 ft. boat for basic training at the disposal of the school, and a 110 ft. combination vessel for use nationwide by all the training schools. Training in instruments will take place primarily aboard these vessels.

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HOME OF THE BIG PURSE SEINER

special report for FNI by NICK WADE

THE OPENING of the new training school further enhances the high status of Austevoll as a leading fishing centre in Norway and a base for some of the top ships in the country's purse seiner fleet.

Ships such as the *Stabla Havgutut and Gerda Marie* based on this community which has always lived off fishing.

Seafaring fishermen from Austevoll, venturing out for cod and herring are mentioned in written records from the 17th century. The spawning cod and the herring provided them with a livelihood in the 18th and 19th centuries.

To Shetland

Later, Austevoll boats traded the herring to Shetland and north Iceland. Later still, mackerel became a quarry, to be gradually replaced in most recent years by the capelin.

Austevoll was the first fishing



AUSTEVOLL is the home of the best of Norway's purse fleet.

community in Norway to see the possibilities of the power block when it was introduced in 1962. Within a few years Austevoll built up a fleet of 12 purse seiners, in about the same time that the Norwegian purse fleet was growing to 456 boats.

Those were the years of the phenomenal catches of Atlantic herring, later found to have been also catastrophic: 1.54 million tons in 1965, 1.95 million tons in 1966, while mackerel catches were around 800,000 tons yearly. Consisting of some 300 islands (of which 10 are inhabited) an hour south of Bergen by hydrofoil, Austevoll is one of the two most important fishing communities in Norway in terms of fleet and catch in relation to population.

In the population of 4,000, there are 500 active fishermen and 233 registered fishing vessels. Of these, the most important are the 32 deepsea purse seiners that could catch about 20,000 tons of pelagic fish a trip.

Ships from Austevoll caught 268,000 tons of Norway's record capelin catch in 1977 of 2.1 million tons.

Austevoll boats participated in the spring blue whiting fishery this year and took about 18,000 tons of the total 115,000-ton catch.

In value, 97 per cent of the catch of all kinds of fish made by Austevoll vessels in 1977 came from the pursers. They also paid their crew

the most: an average of 135,000 kroner (£13,400) in 1976, and probably about the same last year.

Young fishermen wanting to invest in their own boats are told now not to count on getting purser concessions. But the average age of the fleet is 24 years, with the newest purser, Alf Mogster's *Laford*, just delivered. Three more of the oldest ships, some of them converted whalers, will be replaced this year.

Although there are plans for expanding and renewing the purser fleet, the Fisheries Department is

going slow on new applications. At 272 boats with a total capacity around 140,000 tons, the Norwegian purser fleet is already considered too big by just about everybody.

There is mounting interest in Austevoll in white fish trawling. The Fisheries Department is considering nine applications for 110 ft. (33.5 metre) combined trawl-net-longline-Danish seine boats.

One skipper owner, Martin Thorsen, has bought a seiner in Denmark. He has rechristened her *Stolmavag* and is acquiring the

skinning techniques about which he says the Norwegians have everything to learn from the Danes and the Scots. With Norway planning to phase out third country fishing in the North Sea by 1985, Austevoll plans to get its share of the estimated 250,000 tons of white fish to be taken annually.

Austevoll has also the beginnings of a fish farming industry and great expectations for it in the near future.

There is a small electronics industry on the islands, some dairy and subsistence farming, including wool harvesting from a race of wild sheep known in Western Norway since the first millennium and surviving today only in Austevoll.

THE new training complex from the air. The fish farm station can be seen on the left.

FISH TACKLE

SAFETY NETS FOR THE BUILDING TRADE

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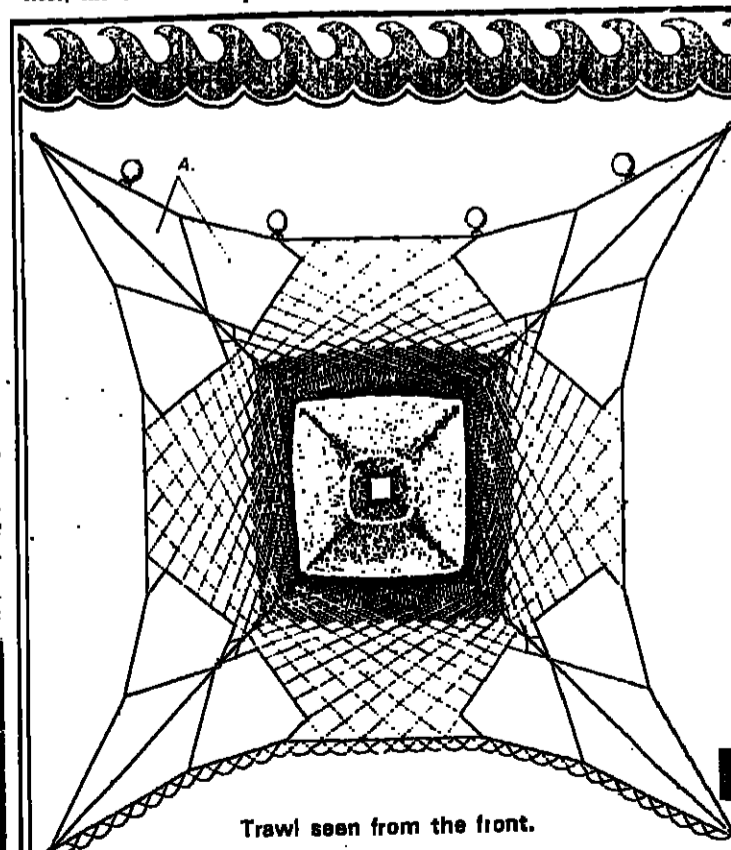
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Trawl seen from the front.



PART OF the Austevoll fleet. The area supports some of the best fishermen in Norway. It is also one of the country's most important fishing communities.

TRAINING TOPICS

Preparing for fishery needs in Sri Lanka



REPAIRING a net on a beach in Sri Lanka. Small-scale fishermen are in urgent need of nets, and repairing is an essential part of the fishing operation. Picture by FAO.

IN Sri Lanka, writes our FAO correspondent CEDRIC DAY, the development problems facing the government and the needs of the fishermen are bringing about far-reaching changes in the immediate future.

For example, the increase in mechanised vessels in the small-scale fishery, and the proposed introduction of a number of large trawlers will require an expansion in the island's training facilities and capacity.

The Training Institute in Colombo is concerned with providing trained crews for trawlers while four other centres — one on each coast — look after training for small-scale fisheries.

The Centre at Negombo, for example, can take 25 trainees at a time. Those in engineering and the care and maintenance of engines have a year's course, while those concerned with the operation of fishing gear have a six-month course.

More diversity

Perhaps the most important aspect of the present situation is the need to give more diversified training to meet the requirements of small-scale fisheries. The interest aroused in the possible development of big commercial fishing should not be allowed to obscure the fact that the small-scale fisheries will remain dominant and the most productive sector in Sri Lanka.

Their increasing need for trained manpower for more effective operation of the improved boats, gear and fishing methods, including fish handling, must remain a first priority in the national training programme.

A visit to Galle was noteworthy as a warning in respect of large-scale development activities. There, a harbour for deep-sea fishing vessels has been constructed but few have used the facilities so far. These include a commodious freezing and ice and cold storage plant. The total cost was about 40 million rupees but when I was there less than 10 per cent of storage capacity was in use.

Practical way

The most practical way of deriving a reasonable level of use from the harbour and plant appears to be the development of the tuna fishery (which starts at a distance of 15 miles from the shore) perhaps through a joint venture.

On the other hand, there were hundreds of boats along the beaches all the way from Colombo to Galle and fishing activity in evidence everywhere.

An investigation into the requirements of the small-scale fishermen showed that, in general, they were in urgent need of nets. Their shortage in this respect is said to be about 50 per cent.

CARIBBEAN INSTITUTE GETS MORE HELP

A NEW agreement to give further assistance to the Caribbean Fisheries Training and Development Institute has been signed by the governments concerned, FAO and the UN Development Fund.

The Institute, located in Port of Spain, Trinidad, and serves Barbados, Guyana, Tobago and Trinidad. It has been in operation since 1974, assisted by UNDP and FAO.

More than 1.3 million dollars were provided but, due to financial stringency, not all the required aid could be given, hence the new agreement to complete the assistance programme.

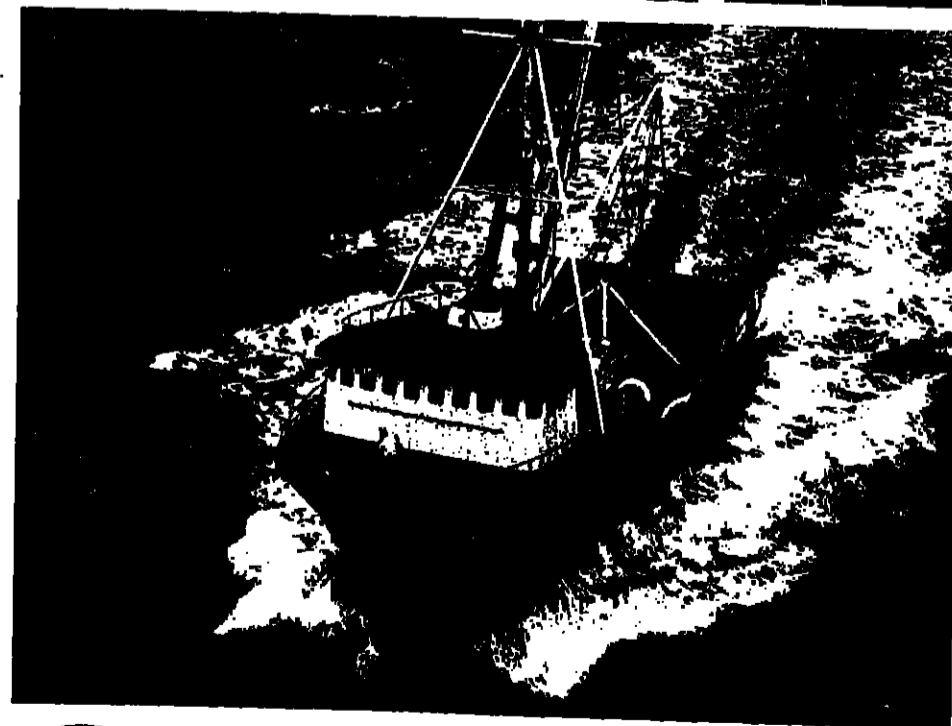
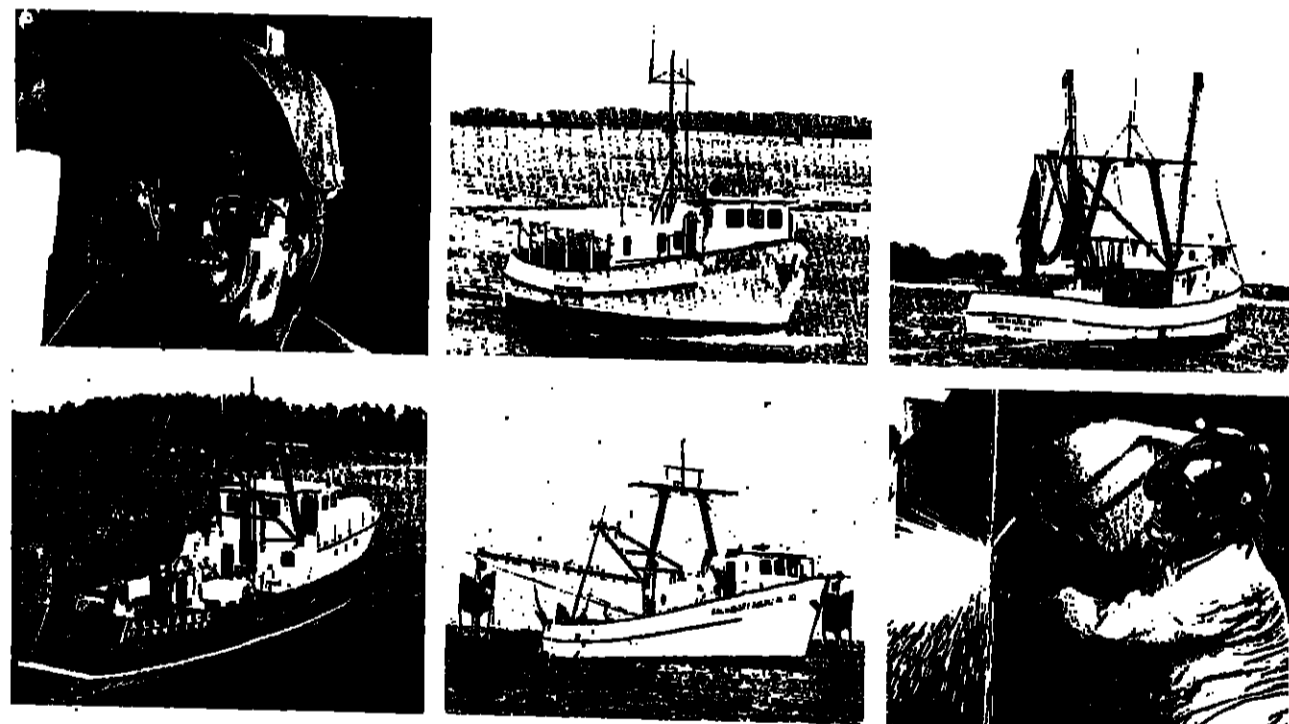
The objectives of the new agreement include: help in managing training activities and in consolidating the

establishment of the Institute. There will be advice on problems related to the participation of trainees.

Also to be considered are problems related to the future status of the Institute. In particular, issues to be resolved are the provision of general maritime training and how to secure the necessary continuing financial support.

The FAO officer responsible for helping to achieve these objectives will be a senior adviser/master fisherman who will be assigned to the Institute for a year. Two fellowships will be awarded to local skippers to enable them to obtain master fisherman certificates, since staff with qualifications at this level are essential for the Institute.

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Workers in an Ecuador shrimp plant prepare a catch for processing. Shrimping is an important part of the industrial-scale fisheries in Ecuador. Picture by FAO.

School plan aids Ecuador

THE School of Fisheries in Mantua, Ecuador, continues to move ahead with its ambitious training programme. This forms part of Ecuador's strategy to make the best possible use of her aquatic resources.

Described in *FNI* in May 1977, the centre at Mantua cost nearly US\$1 million to plan, build and equip. It was funded by a World Bank loan within a four-part programme for fishing development.

The first 90 trainees graduated from the School at the end of 1976 and the plan was to increase the number of trainees to about 240 a year.

Engineer Manuel Bayas, Administrative Director of the School (which is within the Ministry of Natural Energy and Resources) told *FNI* correspondent Kenneth Proudfoot that all courses for this year are being completed. During August, September and October, two courses are being provided for sea fishermen and mechanists.

The training programme for Ecuador has the following aims:

- To train people capable of handling the work of fish capture, processing and resource conservation.

- Prepare people to respond to the need for technical development of new systems, gear and fishing equipment.

- Increase educational opportunities to assist exploration of Ecuador's sea resources.

- Carry out practical exercises in fishing aboard the School's training vessel.

Shrimping is one section of Ecuador's fishing industry constantly in need of skilled people to operate its expanding fleet. Early in 1978, a shortage of skilled manpower prompted one company to hire several experienced fishermen and skippers from Chile.

In addition to working the shrimp trawlers, the Chileans are teaching the Ecuadorians to handle the modern fishing gear. So far, this experiment with Chileans in the boats has been a success. Now, other companies are looking for skilled men in Chile as well as in neighbouring Peru.

About 90 per cent of Ecuador's shrimp companies are located in the Guayas province (capital city is Guayaquil).

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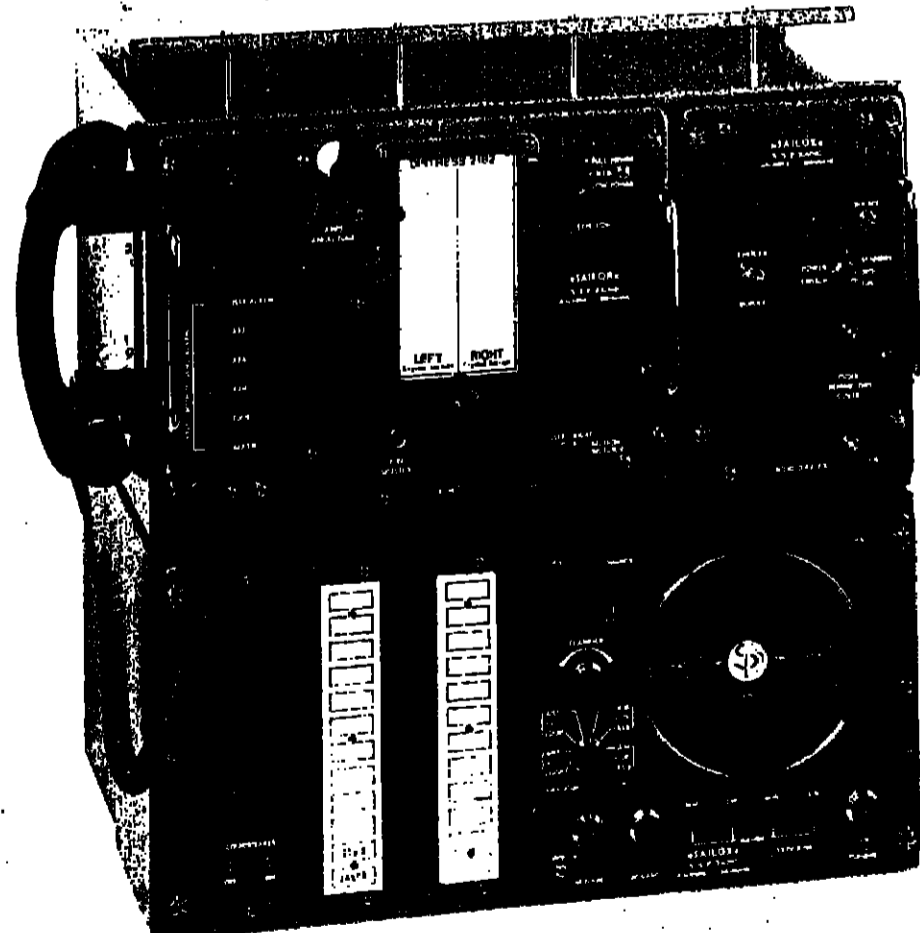
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PORTS & MARKETS

Big trawler company is to leave Grimsby

A LEADING British fishing company is to cease trawling operations in the Humber port of Grimsby from the end of 1978.

Boston Deep Sea Fisheries Ltd. has had ships operating from Grimsby for some 50 years. It says it is now forced to move out because of "greatly reduced fishing opportunities on traditional distant water grounds."

During this year, said Boston, trips by the company's Grimsby-based vessels had proved to be totally uneconomic in both distant and home waters.

It added that deteriorating catch rates from the north Norwegian grounds and poor returns from home water voyages had caused operating losses that could not be allowed to continue without endangering the future of the rest of the company.

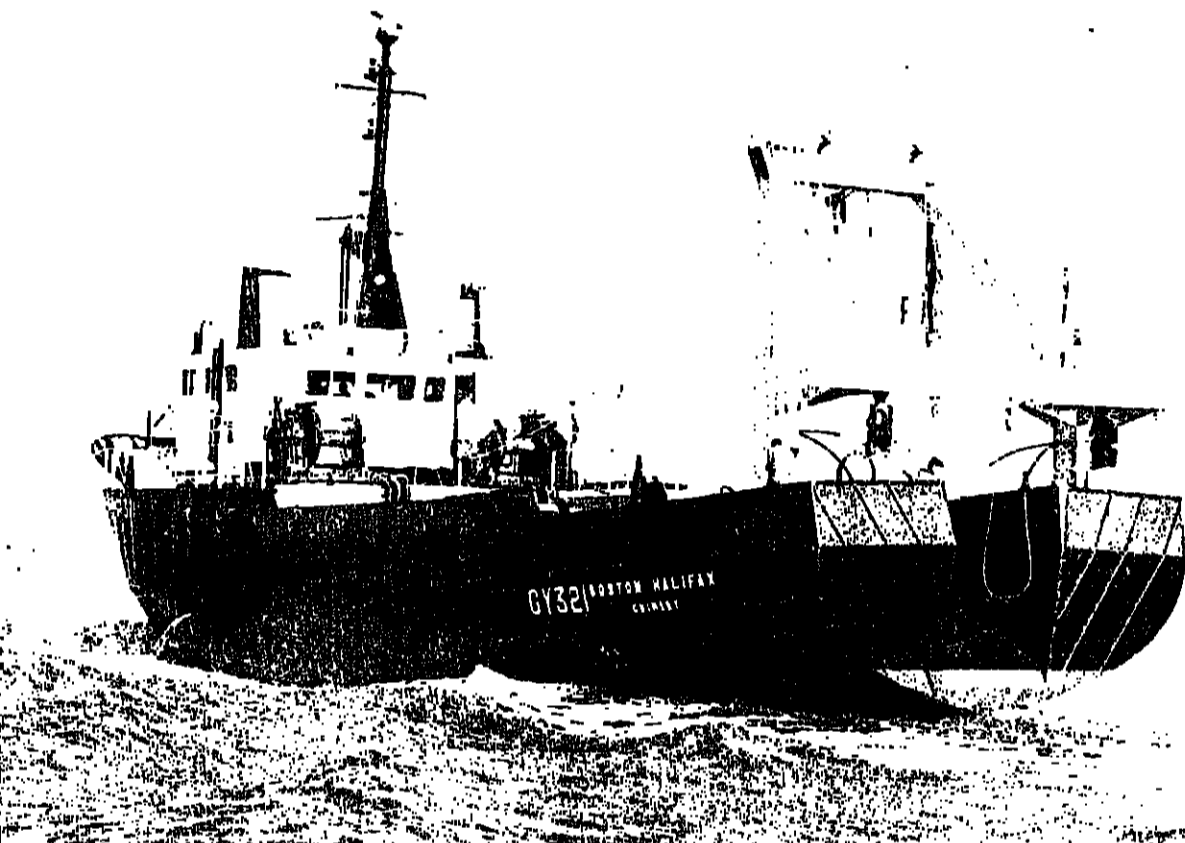
In 1976 Boston had a fleet of eleven trawlers working out of Grimsby, all of them side fishers with the exception of the *Boston Halifax* which is the only wet fish stern trawler operating from the port.

Three of these eleven vessels have already been scrapped, four are laid-up and only four are still operating. Of the four, one has been converted for oil rig stand-by duties and a further two will be converted during the next six months.

The *Boston Halifax* is to be



OUT: Three Boston Group distant water side trawlers laid-up at Grimsby.



MOVING AWAY: The wet fish stern trawler *Boston Halifax* will go from Grimsby to Fleetwood.

transferred to Fleetwood. There, she will continue fishing in home waters, single boat trawling in the winter and probably pair trawling with her

sister ship *Boston Stirling* in the summer. Although Boston is moving its own trawler fleet out of Grimsby, the company main-

tains an agency office in the port. This will continue to handle foreign landings and, possibly, landings by Boston ships from other ports.

LATEST BRITISH DRIFT IS AS COD

FURTHER indication of the change in the make-up of the British fish catch has come with the latest statistics compiled by the Ministry of Agriculture, Fisheries and Food and the

Fishery Economics Research Unit (FERU) of the White Fish Authority. These reveal the full extent of the replacement of cod by mackerel as the dominant species in the catch, if not yet in actual landings at UK ports.

The MAFF figures for the first half of 1978, show that the total for Britain fell slightly in volume, from 448,908 metric tons to 443,274 tons, but that the total value moved up from £118.73 million to £119.38 m.

In England and Wales, cod landings fell from an already low 54,840 tons (valued at £26.86 m.) to 40,349 tons (£20.77 m.). The total for all demersal fish fell from 128,558 to 101,680 tons.

Jumped

But the English and Welsh total for pelagic fish jumped from 109,506 to 155,399 tons, due almost entirely to the big increase in the mackerel catch. For England and Wales in January-June, 1978, this rose to a record 111,160 tons, compared with 64,225 tons. And the ex-vessel value increased from £4.2 m. to £10.9 m.

Looking at British fish supplied over the first three months of 1978, the FERU Supplies Bulletin notes that domestic landings of demersal

CATCH FIGURES SHOW...

TO THE MACKEREL FALLS FURTHER

fish fell by about 25 per cent to 88,984 tons. In England and Wales, supplies were 40 per cent down with catches by distant water ships (including

freezer and factory vessels) falling by 78 per cent.

In the same three months, imports of demersal food fish rose by 62 per cent to 56,558

tons and represented nearly 40 per cent of UK supplies.

Comparing the year ended March, 1978, with the previous 12 months, FERU found that UK landings of demersal food fish were almost 100,000 tons or 19 per cent down. Imports over the same period rose by 29 per cent to more than 200,000 tons.

Looking at exports in the first quarter of 1978, FERU found a remarkable jump of 139 per cent. But 90 per cent of this was due to a rise in exports of frozen fish which, in turn, depended on the enlargement of the market for mackerel.

This was a period of fishing and trading off the south-west coast of England. And there was an increase of 773 per cent in the export of frozen mackerel. This fish, fresh and frozen, made up 77 per cent of the total exports of white fish.

While the most spectacular development in the fishery for mackerel has been the purchase at sea by Eastern

European factory ships from British purse seiners and stern trawlers, this only accounted for a small share of the export trade.

Big importer

Nigeria was the biggest importer of British-caught mackerel. In the first quarter of 1978, she took 21,502 tons valued at £3,686,000; in January-March, 1977, she took 2,884 tons.

Among other big buyers of mackerel, imports by Bulgaria rose from nothing in January-March, 1977, to 12,187 tons, by the USSR from nothing to 10,979 tons, and East Germany from nothing to 6,770 tons.

With mackerel making up almost all the fish in these frozen imports, it is interesting to compare prices per ton. Nigeria's imports averaged £171 a ton. The Bulgarian factory ships appear to have paid about £165 a ton and the Russian ships about £133.

A Spanish-Irish hake project

THE long-delayed Castletownbere fish factory project in West Cork, Ireland, is to go ahead, with financial assistance from the Irish Government.

Announcing this last month, Minister of Fisheries, Brian Lenihan, and Chief Executive of the Irish Sea Fisheries Board, Brendan O'Kelly, said major plans for the development of the country's fishing industry were being considered by the government. The emphasis will be on training facilities and on encouraging fishing for underused species, such as hake and blue whiting.

The Castletownbere project is a joint venture involving the Vigo-based Spanish company Pescanova. The promised factory is to cost about £2 million and will be supplied by Irish and Spanish trawlers.

The Fisheries Board is also believed to be trying to get a similar plant set up in Killybegs in County Donegal on the north-west coast. And it has been discussing other plants with Swedish and Norwegian processors.

Spanish vessels have worked off Ireland fishing hake for many years but the EEC 200-mile limit and other controls have pushed them off Porcupine Bank, one of the best hake areas.

Pescanova is to register three trawlers in Ireland to comply with EEC regulations. It will also buy hake from Irish vessels.

A TOP PORT FOR TUNA...

THE West African port of Abidjan in the Ivory Coast has developed into one of the world's major tuna centres. It is now handling about 70,000 tons of tuna a year from catches landed mainly by locally-owned purse seiners and by French and Spanish ships.

Most of the landings are exported as raw frozen tuna to canneries in France. But this is expected to change with the further development of Ivory Coast canning plants.

The Scodi Company is to expand its capacity from 90 tons a day to 110 tons. Another factory is due to start up this month and will produce 60 tons. By 1980, tuna fishing and processing should be providing employment for 2,000 people in the Ivory Coast.

Philippines firm buys two tuna seiners

SARMIENTO ENTERPRISES, one of the largest and most widely diversified companies in the Philippines, has paid the equivalent of nearly US\$1.1 million for three floating cold stores bought from the Philippine Packing Corporation. It is now negotiating to buy two tuna purse seiners for about \$1.2 to \$1.7 million each.

Sarmiento has formed a new company called Fortuna Corporation to run the venture which will probably be in partnership with two American-based companies.

Acquisition of the two purse seiners would double the catch in the first year and treble it in the second year, said Ben Sarmiento, head of the fishing project.

Philippine Packing Corporation ran a fish canning operation but moved out because it could not get enough fish to store or process.

The reason for this is that the company was a wholly-owned foreign subsidiary of Del Monte Corporation in the United States. Catching fish in the Philippines is now restricted to companies whose shares are at least 70 per cent owned by local interests.

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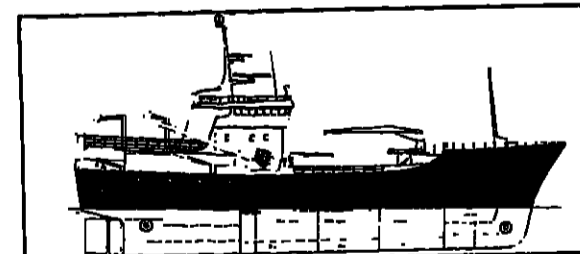
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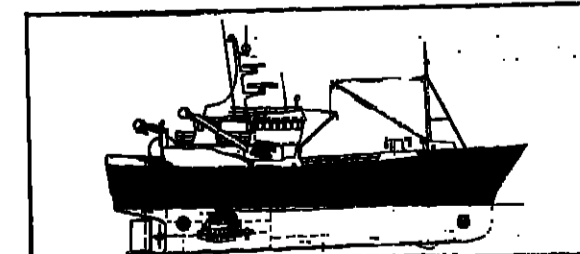
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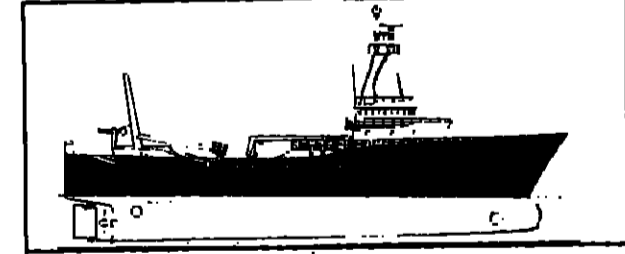
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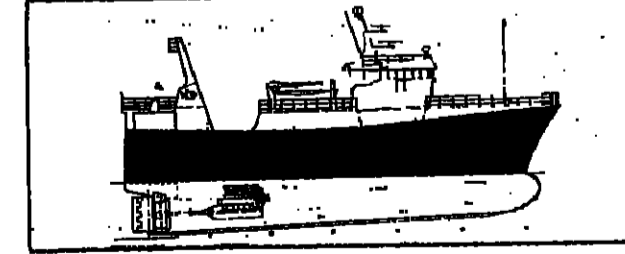
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COMBINED PURSE/LONGLINER
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COMBINED PURSE/STERN TRAWLER
L.O.A. 88.00m; L.P.P. 61.05m; BEAM 11.00m



COMBINED STERN TRAWLER/LONGLINER
L.O.A. 35.05m; L.P.P. 31.20m; BEAM 8.00m; Cargo hold abt. 700 tons

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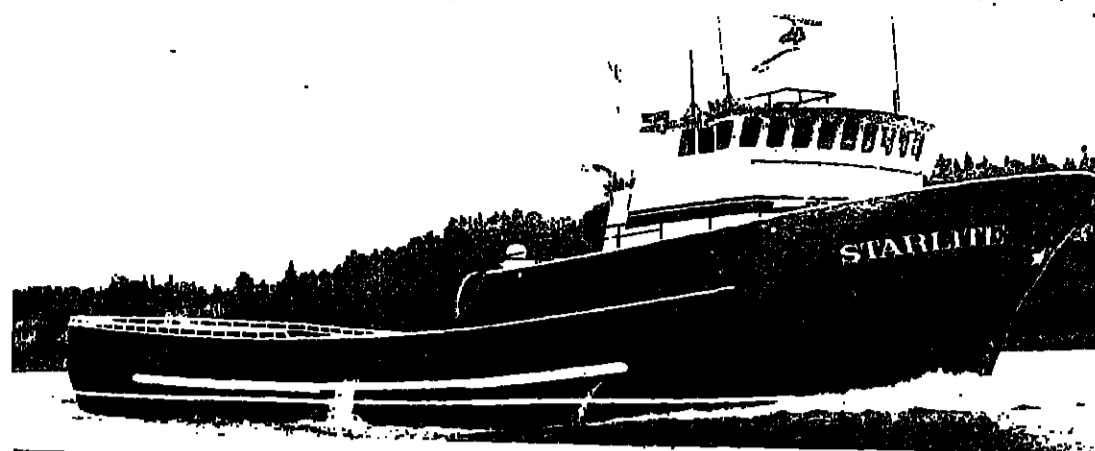
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BOATS & BUILDERS



CHANGES IN THE 'STARLITE'

THE SECOND of the new series of 122ft. combination vessels built in Seattle, USA, by Marine Construction and Design Co. (MARCO), has

made a start in the Alaska King Crab season which began last month.

Named the *Starlite*, the vessel is equipped with fishing stations port and starboard, so that pots and pot lines can be handled with a minimum of manoeuvring.

Deck machinery includes two Marco "KingHaulers," two Marco "KingCollers" and two Marco single-action crab pot hydraulic dumping racks. An 11-ton Rowe telescope hydraulic crane is used for positioning the pots on deck.

With three fish holds totalling 9,500 cu. ft., the *Starlite* can carry up to 220,000 lb. of live crab.

Propulsion is by a Caterpillar D399 turbo-charged, after-cooled diesel of 1125 bhp, coupled to a Caterpillar 7261 hydraulic reverse reduction gear and turning a Coolidge 86-inch, three-blade, stainless steel propeller.

Auxiliary engines comprise a Caterpillar 3304 TA (turbo-charged for a 55 kW generator) and two larger Caterpillar 3306 TA auxiliaries coupled to two 155 kW generators.

The *Starlite* features a number of design changes from the traditional Marco crabber: A single box mast encloses the exhaust pipes, the pilothouse has been stepped up half a deck for 360-degree visibility; and galley and mess areas are reversed so that the mess now faces the afterdeck.

Navigation and communication equipment includes two Lorans, two radars, recording depth sounder, depth indicator, autopilot, gyrocompass, two swh radios, and a radio telephone.

The prototype of the series, the *Arctic Sea*, was described in last month's issue of *FNI*.

Versatile alloy seiner

A NEW aluminium hull longliner and drum purse seiner has been delivered to Fredelia Fishing, a co-operative in Prince Rupert, British Columbia.

The 19.8 metre long *Bold Pursuit* was built by Shore Boat Builders of Richmond, B.C.

Skipped by Peter Wallin, she will work as a drum seiner in the salmon and herring fisheries. She will also long line for halibut.

The boat was designed by naval architect David Moore. She has a beam of 5.86 metres and a depth of 2.75 m.

Propulsion is by a Cummins KT1150 engine of 450 hp at 2100 rpm, turning a fixed-pitch propeller through a 4.5:1 Twin Disc Omega gear.

Her fish carrying space is divided into four compartments, able to take 90 tons of herrings. It is cooled by an air bubble refrigeration system.

Look into Cat Power the 3400 Series

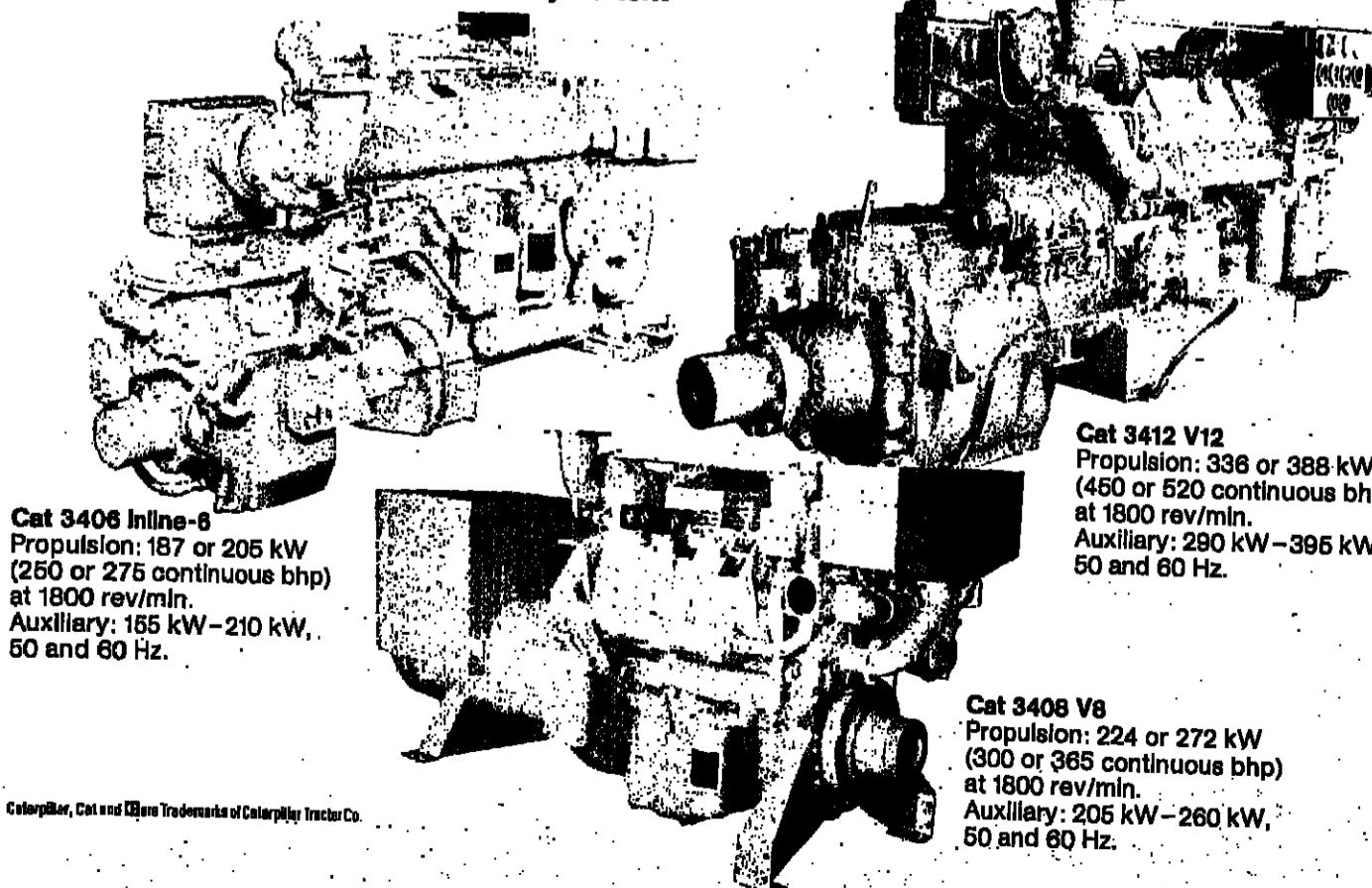
Inline-6, V8 and V12 models offer a choice of six propulsion and six auxiliary ratings. All available with matching marine transmissions or generators — from one source. Caterpillar.

The 3400s are designed to fit easily into smaller engine rooms. Even the 3408 and 3412 models with narrow 65° Vee can be installed in the space once restricted to inline engines. Leaves more room for extra cargo or fuel.

Simple design means less service and maintenance time. The 3400 Series have adjustment-

free fuel systems, quick change fuel, oil and air filters. And for easy access, a choice of starter and dipstick positions.

And more — the 3400 series are backed by Caterpillar dealer support services. Ask your local Cat dealer for our worldwide Marine Service Directory.



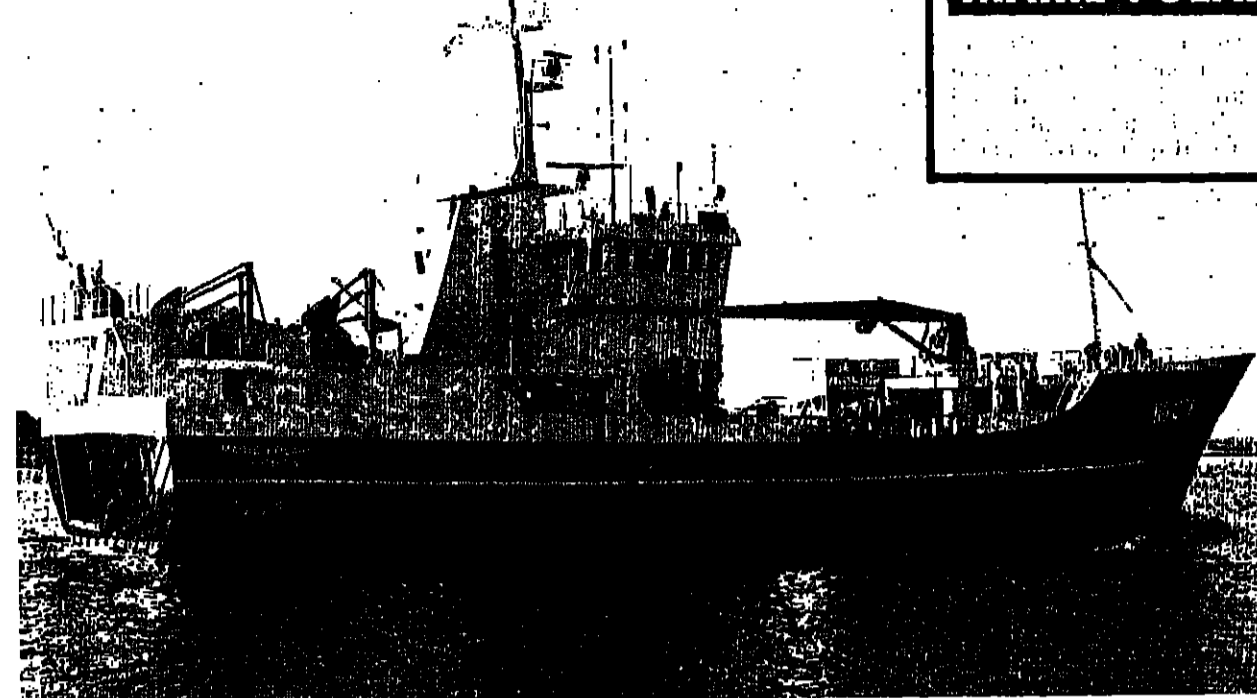
Cat 3408 Inline-6
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Auxiliary: 185 kW—210 kW,
50 and 60 Hz.

Cat 3412 V12
Propulsion: 336 or 388 kW
(460 or 520 continuous bhp)
at 1800 rev/min.
Auxiliary: 290 kW—395 kW,
50 and 60 Hz.

Cat 3408 V8
Propulsion: 224 or 272 kW
(300 or 365 continuous bhp)
at 1800 rev/min.
Auxiliary: 205 kW—260 kW,
50 and 60 Hz.

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MARIE POLARIS—how she measures



BY BIG TRAWLER-PURSESEINER

ONE OF the largest and most comprehensively equipped fishing vessels to join the Danish fleet has been delivered by Aalborg Vaerft A/S to the firm Marie Polaris II, which is represented by Henry Espersen, a fish exporter of Hirtshals.

The *Marie Polaris* is a combination purse seiner and trawler.

She has main and shelter decks, long forecastle deck, raised stem and stern and stern ramp offset to the port side.

She complies with Det Norske Veritas class +1A1 'Stern Trawler/Deep Sea Fishing "S" — Ice C and to the Danish authorities' requirements for vessels with unrestricted service. The ship was designed by Skipsteknisk A/S of Aalesund.

Her total loading capacity is 1240 cu m of which 840 cu m is in tanks with refrigerated seawater (RSW) cooling. The other 400 cu m consists of 'tween deck holds for fish in bulk or in boxes. The ship has bunker capacity for 175 tons of fuel oil and 30 tons of fresh water.

Propulsion is by a six-cylinder four-stroke MaK type 6M 453K diesel of 2250 bhp at 600 rpm. This turns a controllable pitch propeller through Ulstein reduction gear. The propeller is in a fixed nozzle.

Like most modern combination trawler/purse sein-

ers, the *Marie Polaris* has bow and stern thrusters. These are of 300 and 350 hp. With the H. Hinze flap rudder, they give the ship extremely good manoeuvrability.

Electrical supply is taken from a shift generator and

two diesel generators. The NEBB shaft generator of 1250 kVA is directly coupled to the front of the main engine. The auxiliary machinery consists of two 300 hp Cummins engines each coupled to a 250 kVA generator. The main

switchboard is by Thrig-Titan.

Steering is by Frydenbo hydraulic gear, and the ship is equipped with Sperry gyro compass and Decca-Arcas autopilot.

The refrigeration system

was supplied by Thomas Th. Sabroe A/S. It is an automatic plant arranged for the cooling of seawater which is circulated to the ship's eight RSW tanks.

Freshwater

An Atlas plant provides three tons of freshwater every 24 hours.

Deck equipment consists of hydraulic winches and cranes.

The purse seine winch, by Karmoy, has a capacity for 1500 metres of 25 mm wire on each drum and has a pull of 25 tons.

The trawl winches are also made by Karmoy. Each drum takes 1500 m of 25 mm wire. A Karmoy net drum on the boat deck aft has a capacity for 14 cu m and pull of 25 tons.

The ship has a Bjørshol Triplex net winch, a net hauler winch, two transport rollers, fish pump and anchor and mooring winch.

She is also equipped with

two deck cranes by Maritime Hydraulics — one of 3.5 tons capacity with 13 m radius and one of two tons with 6 m radius.

Arrangement of instrument and control consoles in the wheelhouse were planned in co-operation with the vessel's skipper.

Navigational aids include Decca RM 9140 and RM 9290 radars, Simrad radio direction finder and doppler log type NL, ICR satellite navigator, Decca Navigator, and Raytheon weather chart receiver.

Fish finders

For fish finding, the ship carries Simrad SU sonar, Trawl-Eye, EQ38 and EX50C echo sounders, and Simrad Trawl Watch.

Radio transmitter/receiver and VHF sets were supplied by SP Radio.

Accommodation is arranged for a crew of 16, most of them in single-berth cabins.

PANTHER Nokalon floats

Orange: Buoyancy from 753 g to 8574 g
Working depth from 400 m to 600 m
Side and centre holes

Blue: Buoyancy 2505 g to 3108 g
Working depth 1000 m
Side and centre holes

PANTHER/Nokalon screw floats

Buoyancy
3190 g to 9033 g.
Working depth
350 m to 600 m.

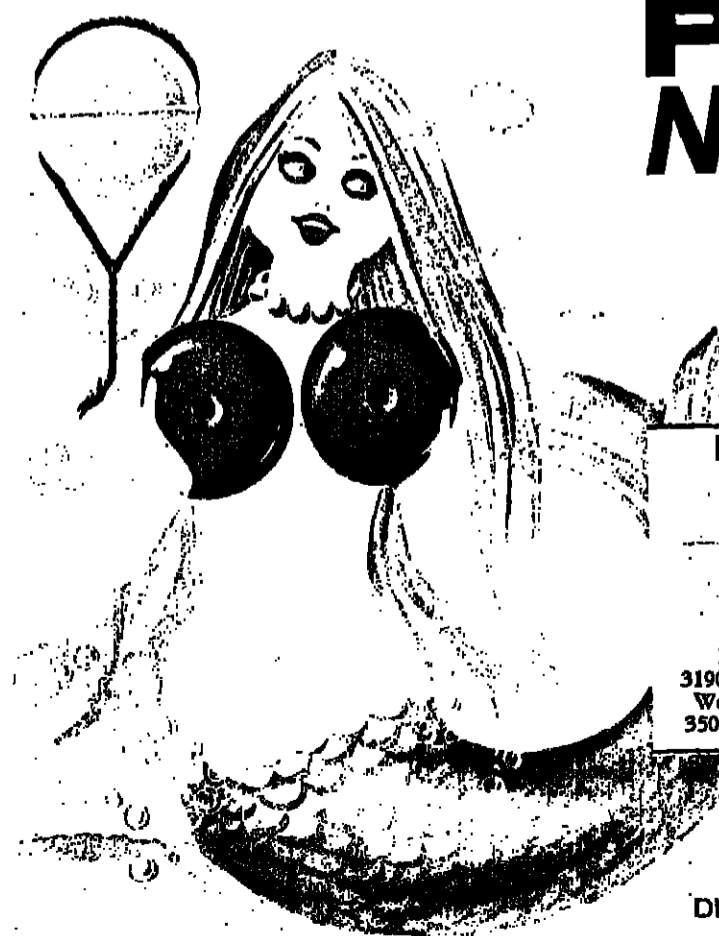
Easy to screw
directly on to the net.

When screwed on,
firmly secured.

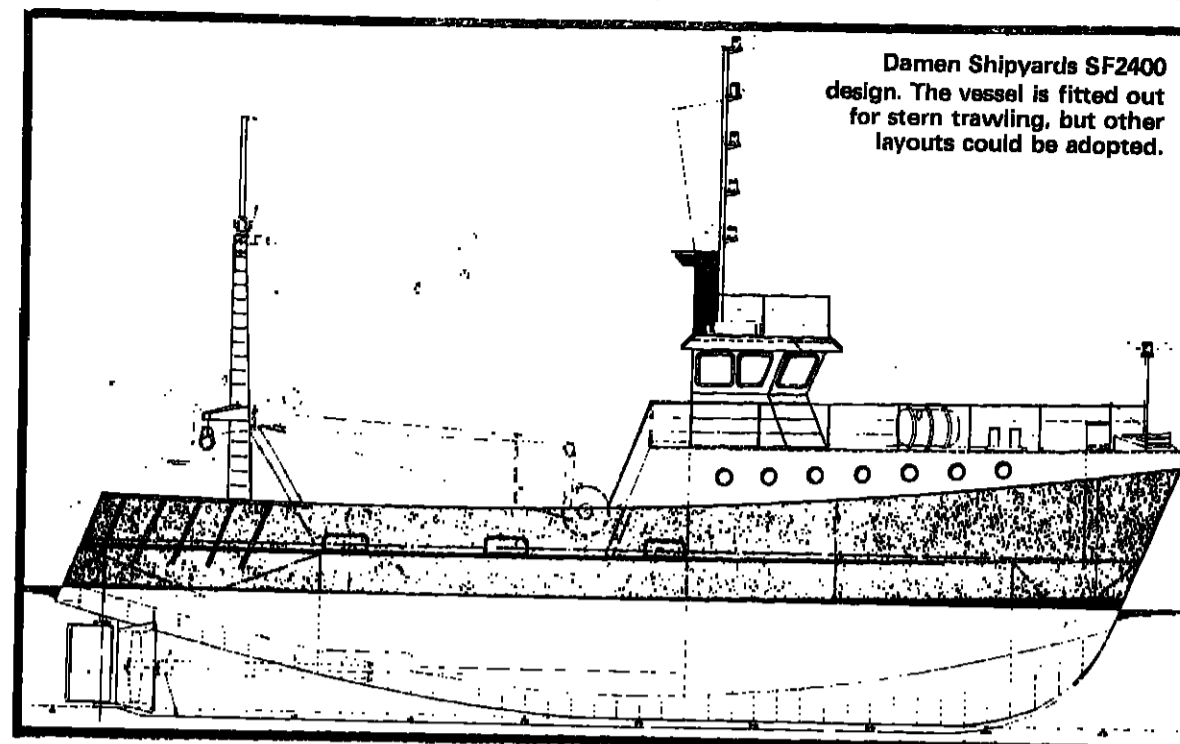
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BOATS & BUILDERS



Damen Shipyards SF2400 design. The vessel is fitted out for stern trawling, but other layouts could be adopted.

VARIETY OF NEEDS

COMING IN on the demand for economically-priced standard steel fishing vessels, Damen Shipyards at Gorinchem in Holland are developing a range of series-built hulls from 16 to 40 metres long (52 to 131 ft.).

Depending on size, the vessels can be fitted out as stern trawlers, shrimp trawlers, beam trawlers, purse seiners or combination seiner-trawlers.

The 'Stan Fisher' range includes 10 designs, the largest of which — for a 40-metre long stern trawler purse seiner — is still under development.

The other hulls graduate from 16.0 metres to 22 metres, 24 metres and 32 metres.

Damen claim that their vessels are efficient, high-earning units designed to suit a wide variety of uses and fishing waters.

The Stan Fisher 2400, for example, meets all IMCO requirements and is, according to

Dutch yard has designs to offer

Damen, "very suitable for operations within 200-mile fishing zones."

The hull can be fitted out for stern trawling, beam trawling, purse seining or a combination of all three.

Dimensions

Overall length is 24 metres with a moulded breadth of 7.0 m., depth of 3.4 m. and draught amidships of 1.96 m.

The fish hold has a capacity of 110 cu m and there are bunkers for 28 tonnes of fuel and 11 tonnes of fresh water.

Propulsion engines between 350 and 670 hp are recommended for the vessel which will give a free running speed of between 8.5 and 9.6 knots. A propeller nozzle can be fitted to increase bollard pull by approximately 15 per cent.

Engine and reduction gear are mounted on reinforced beds to minimise vibration and there is

ample space in the engineroom for cooling or refrigeration plant.

Accommodation in the Stan Fisher 2400 comprises private quarters for the skipper along with a twin berth cabin and two four-berth cabins.

Damen's smallest boat, the Stan Fisher 1600, is for the inshore fisherman probably wanting to replace a wooden boat and to fish waters beyond his present range.

The 1600 can be fitted out as a stern trawler, pair

trawler, beamer or purse seiner.

She has a length of 16.0 m, moulded breadth of 6.0 m, depth of 2.3 m and fish hold capacity of 30 cu. m.

Power range

The power range is 184 to 360 hp which gives a bollard pull of between 1.8 and 4.4 tonnes.

Fuel and fresh water tanks have capacities of 7.5 and 2.6 cu. m and the vessel's full power endurance is four to eight days.

SERIES BUILT FOR A VARIETY OF NEEDS

WOOD BOATS GET SMALLER SUBSIDY

THE Department of Fisheries in Nova Scotia, Canada, has expanded the scope of its vessel assistance programme.

Initially, this was intended to help with the building of 20 multi-purpose boats in the 65 ft. (19.8 metre) range by providing a subsidy of 25 per cent of approved costs.

The programme will now include boats between 50 and 65 ft and greater emphasis has been placed on construction in steel, aluminium or GRP.

Under the new provisions, boats of these materials within the agreed size range can qualify for up to 35 per cent of provincial subsidy if no federal subsidy is available.

If there is a federal subsidy, then an additional 15 per cent provincial subsidy may be provided.

For wooden boats of 50 to 65 ft, the subsidy is less — 25 per cent provincial, or no subsidy if one is provided by the federal government.

Reasons

Fisheries Minister Dr. Dan Reid gave several reasons for the changes. Nova Scotia yards building larger wooden boats could not meet current demand, he said. Unless competitive boats made of other materials were available within the province, fishermen would have to seek boats elsewhere.

Scottish top earner sails south

THE 38.7 metre stern trawler *Clarkwood*, top earner for 1977 in the Scottish port of Aberdeen, was last month being fitted out to go mackerel fishing off the south-west of England.

Her new installations include two chilled seawater tanks with a total capacity for about 50 tons. A Hlab 1165A hydraulic crane will work a brailer for taking fish from the tanks.

A new Elac sonar and netsonde will help her spot the mackerel, which she will catch using an Engel trawl.

Built in 1976, the *Clarkwood* is powered by a 1,700 hp Mirreles Blackstone engine.

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Norwegian yard's third seiner-trawler

BUILT by Ulstein Hatlo for A/S Fliskedrift of Tromsø, the 62 metre long *Grimsholm* is the yard's third large combination trawler and purse seiner to be delivered in 1978.

She has a length b.p. of 55 metres, a moulded breadth of 11.6 m and depth to shelter deck of 8 m. The ship was designed by Vik and Sandvik.

The 1,200 gross ton *Grimsholm* is powered by an MaK model 9M 453 AK diesel engine developing 3,400 hp at 600 rpm and has a speed of 16 knots. She is fitted with Ulstein 500 hp bow

and stern thrusters and Ulstein passive stabiliser system.

Accommodation is provided for a crew of 19.

Gear handling equipment includes Rapp Hydema main winch and net drum, and Triplex power block.

Simrad sonar

The ship has a comprehensive array of electronic fish finding and navigation equipment. This includes Simrad CD situation display sonar, Simrad echo sounders, and Magnavox satellite navigation system.

Reels aft on fly dragger

THE completion in the UK of the 26-metre (85 ft.) *Kestrel* by Campbeltown Shipyard for Skipper Ian Sutherland of Hopeman marks an important development in the Scottish flydragging method of seining. All her gear-handling machinery is located aft of the deckhouse.

This has significant safety advantages as it enables the gear to be worked from the stern. Ropes are kept away from the foredeck where the crew gut and box the fish.

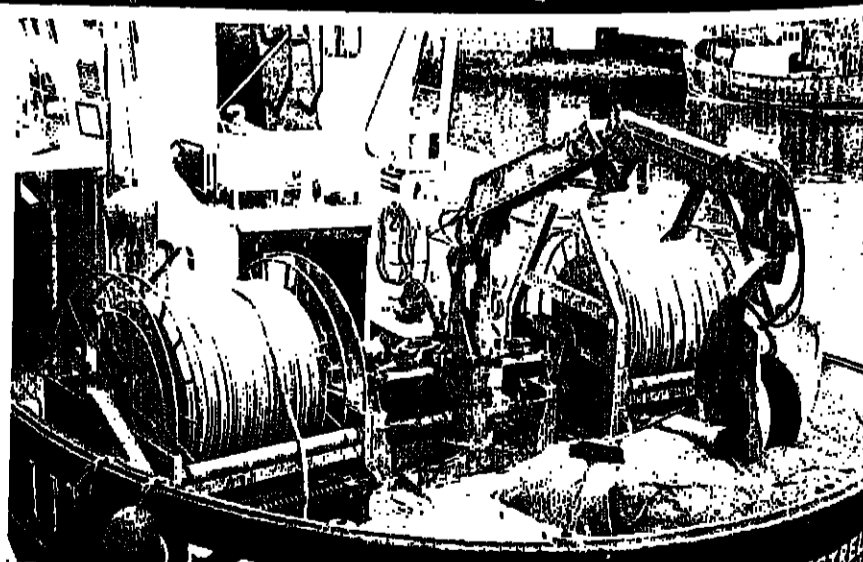
The *Kestrel* has also been fitted with a shelterdeck extending from deckhouse to whaleback to give the crew extra protection from the weather.

Many local fishermen think that this layout will be adopted by other skippers. They now feel that the after deck is the logical position to house the gear-handling machinery.

Kestrel was initially being built as a conventional seiner, with the intention of placing her winch and rope reels in the traditional position forward.

It was during her construction that Skipper Sutherland decided on the new layout.

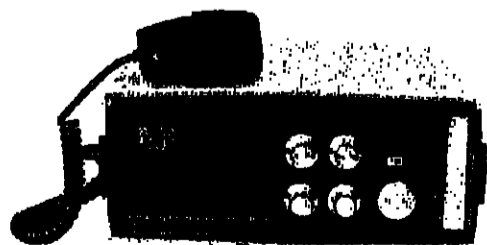
The deckhouse had to be made shorter to provide more space at the stern.



Above: The 'Kestrel's' aft deck showing the Norskov Laursen seine winch, twin Lössle Hydraulic rope reels and Lössle power block.

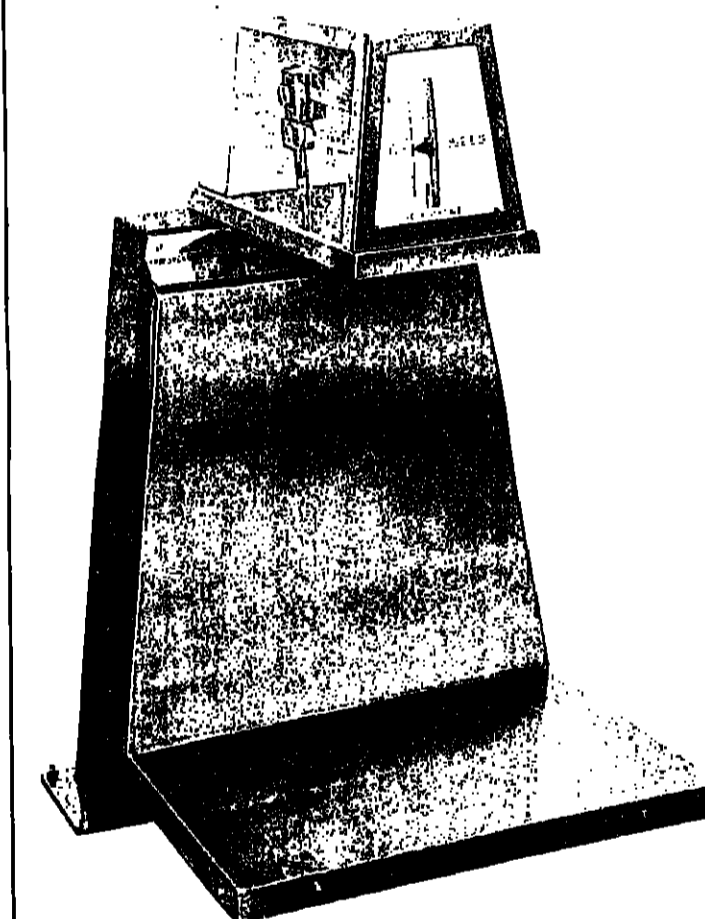
Left: The new vessel shortly after completion. She is powered by 800 hp Mirreles Blackstone engine.

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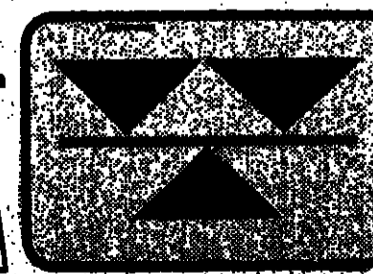
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SPEED AT A BUDGET PRICE

OF INTEREST to developing countries requiring low-cost, high or low-speed boats will be the new "Task Force" Q18 from Boat Showrooms of London.

The Company has already supplied two craft, based on the same hull design, completed to British White Fish Authority specifications.

The new Q18 measures 17 ft. 6 in. long overall, with a 7 ft. beam and 0.75 ft. depth. Her weight is 1,200 lb., less engine.

At a recent demonstration on London's River Thames, a Q18 was put through her paces. She is powered by an 85 hp outboard diesel and is claimed to have a speed of 30 knots.

The demonstration boat (pic-

tured below) has short decks forward and aft of a steering console. The nets are shot over the stern and hauled over a bow roller. It is claimed the boat will plane with half-a-ton aboard.

There are two water drains aft which clear the deck.

The boat demonstrated is expected to be in use all-year-round in UK waters.

For commercial work the outboard can be replaced by an in-board, with a choice of sterndrive or water jets.

Boat Showrooms of London says that the Q18 is built to a heavy specification.

Price of the multi-purpose craft is around £2,000, less engine.



Fishing vessels — with or without financing

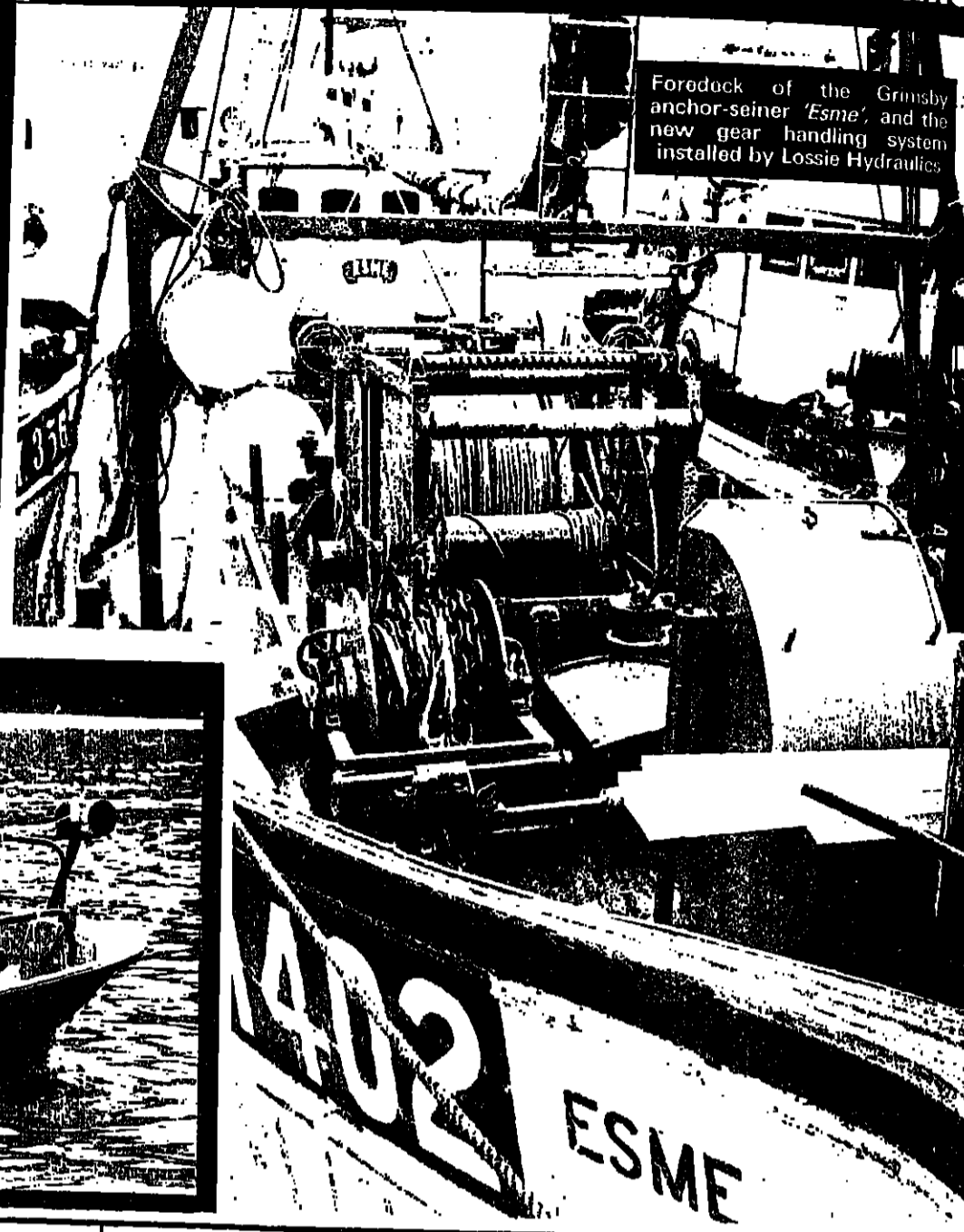
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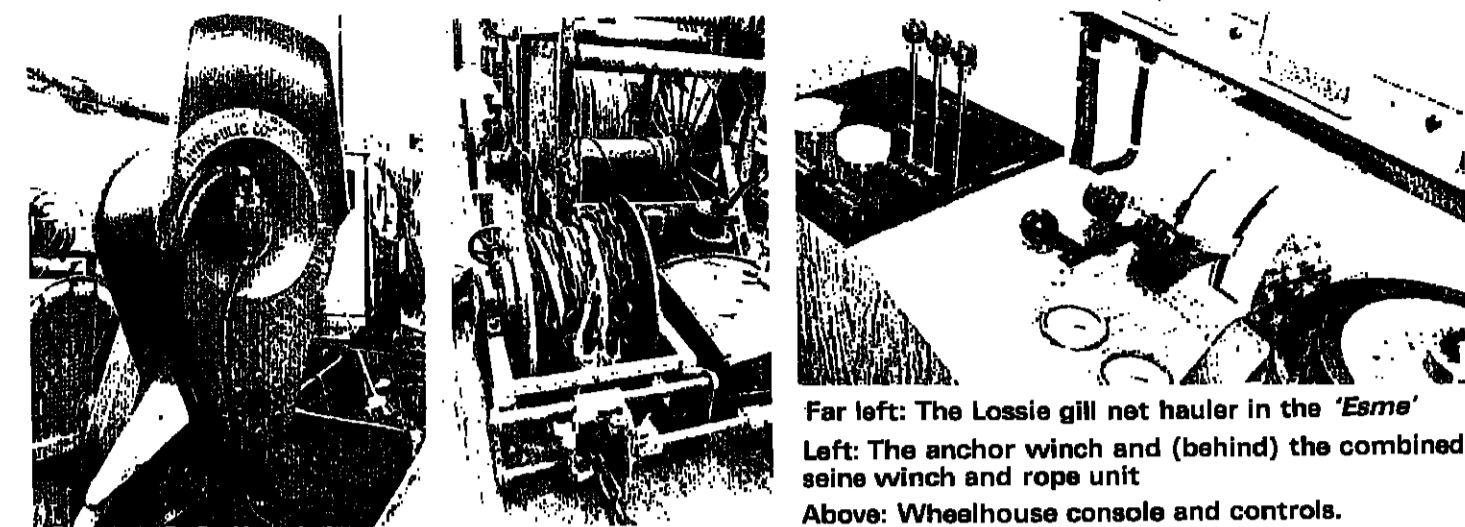
Boat from British port of Grimsby



Foredeck of the Grimsby anchor-seiner 'Esme' and the new gear handling system installed by Lossie Hydraulics

is first to have 'Lossie' hydraulic reel-winch system...

NEW AID



Far left: The Lossie gill net hauler in the 'Esme'. Left: The anchor winch and (behind) the combined seine winch and rope unit. Above: Wheelhouse console and controls.

TO ANCHOR SEINING

FOUR YEARS ago skipper Jimmy Howard of Grimsby, England, fitted a new lightweight three-drum seine rope storage system made by the Scottish firm Lossie Hydraulics of Falkirk in his anchor-seiner *Bekima*.

It was the first piece of equipment of its kind in a Grimsby boat and it helped prepare the way for other Lossie rope drum installations in British boats, both for fly-dragging and anchor-seining.

Lossie Hydraulics has now achieved another "first" at Grimsby with the introduction of an ingenious new-design hydraulic combined seine winch and rope drum unit.

This is suitable for fly-shooters or anchor-seiners and the prototype has gone into Skipper Howard's 50 ft. (15.24 metre) long seine netter *Esme* as part of a major overhaul and refit.

He was planning a similar installation for the *Bekima* two years ago, but deferred it when he replaced the boat with the *Esme*.

The new unit, as with the original drums in the *Bekima*, has been designed in conjunction with Skipper Howard by Lossie Hydraulics chief, Mr. Jimmy Allan.

Last winter, the *Esme* was re-engined with the super-charged Kelvin TASH diesel. Then, after trials, she travelled to Grangemouth for a major "face-lift" on deck.

This work entailed, fabrication and fitting a new steel mainmast, resiting the boat's Lossie power block, installation Helmsman 200 Scan-Steering gear, installation of a new Lossie gill net hauler, the combination reel and winch unit and a small hydraulic anchor chain winch.

Custom-built

The winch and reels were in fact displayed at the Catch '78 in Aberdeen, where the unit attracted great interest. It is custom-built to suit all sizes of fishing vessel from 40 ft. upwards.

In the *Esme*, the drums, manufactured from mild steel tubing and weighing approximately 560 lb. (255 kg) each, have been fitted fore and aft amidships in a frame. Located between the drums are two 2.5 ton pull seine winches, or whipping drums.

Both seine winches have independent hydraulic control from the wheelhouse as do the rope drums which have a capacity on each reel for 24 coils of 2 1/4 in. seine rope to allow for turning the 12 coils of ropes off one reel and onto another before shooting, or when necessary.

As the spooling on gear for the reels is positioned on top of the frame, there is no need to run the rope across the deck once heaving has taken place.

Top skipper was impressed

Everything is wheelhouse controlled. The system is driven by two Sundstrand variable delivery pumps able to give a pull of three tons to each barrel. Barrel speed is controlled by two Morse controls giving a range 0-200 rpm and 0-70 coiler turns.

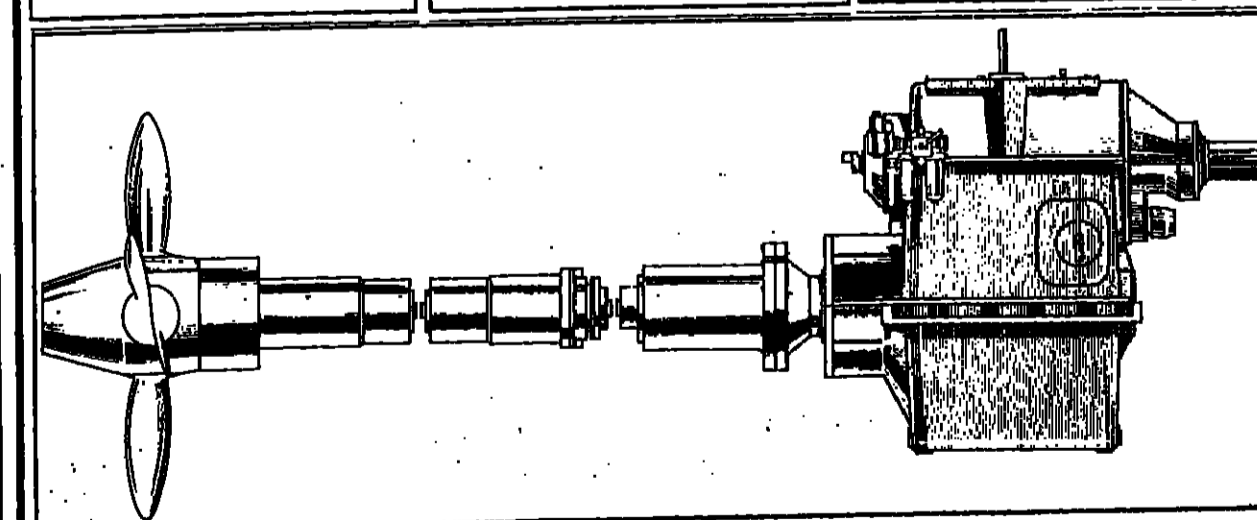
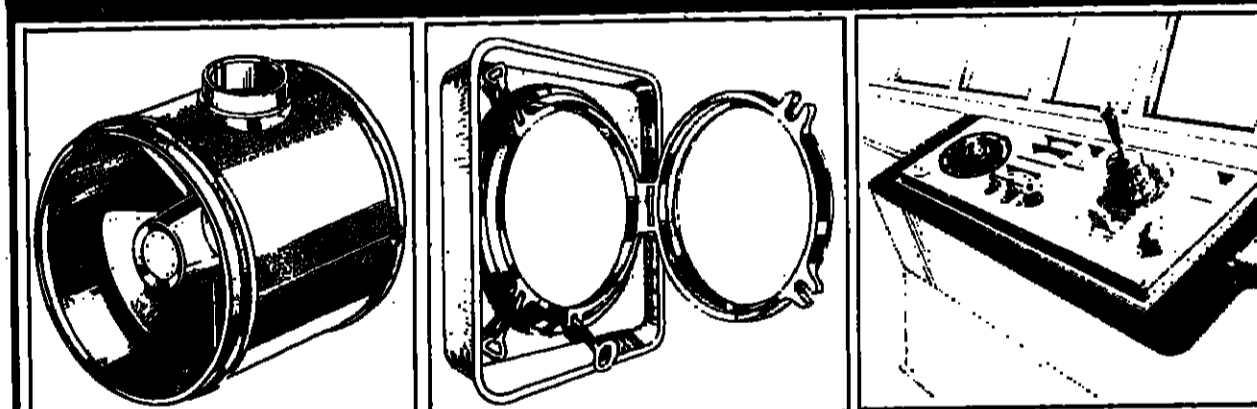
Each head is independent and fully reversible. One feature of the system is that it enables fishing to be done without the need for surging. In the *Esme*, it is now only necessary to slow down the appropriate barrel until the ropes are levelled. Speed is then stepped up to that of the other barrel.

Constant

During trials, hauling pressures were constant and very low while fly shooting. When towing against tide, pressure was only 1,000 psi and a total of 17 hp was recorded at each pump, a requirement from the engine of only 34 hp.

Skipper Howard and the Lossie representatives say they were delighted by the way the system worked during trials. Also aboard was leading seiner skipper David Tait of Peterhead in Scotland, who was also impressed by the performance of the system.

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MECHANISED LONGLINING...

A 4-page Special Feature

‘It’s the first time I have ever enjoyed living. When we get into port, we just tie up at the quay and go home. No overhauling tasks like the other lads!’

Skipper Brian Magee, of the San Joseph, commenting on the snood clip system.



How WFA helped to develop a System for

TOM WRAY describes a new mechanised longline system developed and tested by the White Fish Authority in co-operation with British fishermen. Its aim is to enable owners of line boats to work more efficiently and safely without having to spend large sums of money. It is arousing great interest around the British Isles since recent successful trials off the south-west coast of England.

Joining mechanised longline systems from Norway and now from Marco in Seattle, it offers yet another choice for fishermen round the world seeking to take advantage of the growing opportunities for line fishing. The writer is with the Industrial Development Unit of the White Fish Authority in Hull.

He first gives a brief history of the development of the project. On the following pages, he describes the practical system finally tested and now going into production.

THE NEW British longline system uses clip-on snoods and comprises a line drum, hauler, snood storage "carousel" and shooting tube. It was developed by Falmouth engineer, Ian Frost, and skipper-owner, Brian Magee, in conjunction with the WFA Industrial Development Unit.

It started in a basic form in 1977, when Ian Frost and partner Bob Plant fitted out their 30 ft (9.15 metre) line vessel Kvestor with a system designed and built by themselves. Featuring a line drum, hauler and clip-on snoods, the system had glassfibre bins with ply partitions for snood storage.

The snoods were dropped into the bins clip first, the hooks being hung over the partitions. Either before or during the voyage out to the grounds, each hook was baited and the complete snood hung by the clip onto a sloping wire. When shooting, the crewman simply took one clip at a time from the wire and snapped it onto the passing longline.

This use of clip-on snoods is no new idea. They have been used successfully off the west coast of America in all types of line fisheries for many years,

although the number of hooks, and therefore clips, shot on a single fleet of lines is usually very much less than aboard European vessels.

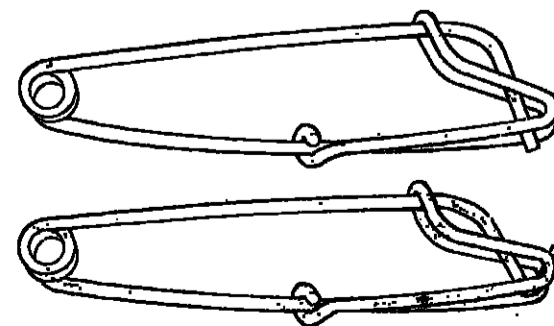
The clips used by the Kvestor were imported from the Lühr Jensen company of Portland, Oregon, and Ian Frost now holds the agency in the United Kingdom through his company, Transatlantic Fishing Systems.

Easy to use

Made from heavy-gauge, zinc-plated wire, the clips are available in a number of different sizes, the common ones being type LJ70 (for 7 to 12mm dia. line) and type LJ72 (for 5 to 7mm dia. line). These are shown in the drawing. Very easy to use, they are simply pressed open, entered onto the line and released, the line being gripped tightly between the middle and outer wires.

Following the success of the snood clip system in the Kvestor, an increasing number of British fishermen started to use the clips.

One of these is Falmouth fisherman Brian Magee, owner of the 28 ft (8.5m) Patricia II. Although he liked the basic concept of the system, and considered it a marked improvement over traditional methods, he was not happy



● This drawing shows the two types of snood clips used in the system. The top clip is for lines of 7 to 12 mm diameter. The bottom clip is for lines of 5 to 7 mm diameter.

helped to British small boats



with storing the snoods in bins, claiming that these not only take up valuable deck space, but that they are also inconvenient to use.

After devising several different methods, he hit upon the idea of storing the snoods on racks carried in a carousel — a structure which could be rotated to a number of different positions convenient for shooting and hauling. The advantages of using such a storage system would, he considered, probably more than justify the additional cost to most longline fishermen.

After giving the carousel considerable thought, and discussing his proposal with a

local firm, Mullion Engineering, skipper Magee asked the WFA Industrial Development Unit for assistance to develop the idea further.

Recognising that the idea had considerable potential, the WFA readily accepted skipper Magee's proposal. It agreed to design and produce detail drawings for a 'prototype' carousel, which would then be manufactured by Mullion Engineering for installation and trials in the Patricia II.

Unfortunately, Patricia II broke her moorings during strong gales in March 1978 and suffered extensive da-

mage when she was swept onto rocks. But another Falmouth skipper-owner, Joe Lydford, saved the day when he offered his 45 ft (13.7 m) vessel, San Joseph, for trials.

The installation in the San Joseph is described and illustrated on the following pages.

With the trials completed and the system proved, the WFA is producing drawings for a commercial carousel. This will be based on a standard module which could be built up in a number of ways using different mounting systems, to provide storage for 2,000, 4,000, 6,000 or 8,000 snoods.



Left: Baited hooks go into the shooting of a snood clip system. Right: Brian Magee, skipper of the San Joseph, showing the snood clip system.

Meanwhile, the prototype continues to attract wide interest, with skippers from all over the country taking time off to visit Falmouth to discuss the system with Brian Magee.

Transatlantic Fishing Systems are continuing to supply large numbers of snood clips and other longline equipment to all parts of the UK and also to several other

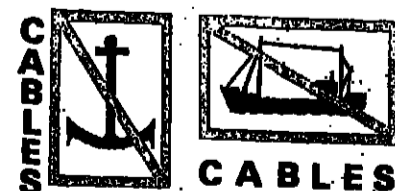
countries, including Brunei, Denmark, the Faroes, Iceland, Malawi, Norway and Sweden.

Ian Frost is keen both to market the carousel when it becomes available commercially, and in developing the system further — possibly to include automatic baiting and clipping-on of the snoods. He is also considering manufac-

turing the snood clips under licence in the UK.

Further information on the snood clip system and carousel can be obtained from Transatlantic Fishing Systems, 42 Comfort Road, Mylor Bridge, Falmouth, Cornwall, or White Fish Authority, Industrial Development Unit, St. Andrew's Dock, Hull, North Humberside.

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MECHANISED LONGLINING... PART TWO Advantages of the snood clip system

Successful tests in the San Joseph

THE ARRANGEMENT of the mechanised longline system installed and tested aboard the 45 ft Falmouth boat *San Joseph* is shown in the drawing.

An hydraulically-driven drum, manufactured by Transatlantic Fishing Systems, carries the 6.8 miles (11 km) of line.

The drum, positioned in front of the wheelhouse, is equipped with guiding-on gear. There is also a manually-operated disc brake to slow the drum during shooting and to stop it completely in an emergency.

The drum is coupled hydraulically in series with a Spencer-Carter 1,000 lb pull line hauler at the starboard rail, the line from the hauler being taken up by the drum.

The speed of the drum is faster than that of the hauler so that the drum maintains a tension in the line.

If the hauler is stopped during hauling, the drum simply stalls, thus maintaining the tension in the line. The drum proceeds to take in line again as soon as the hauler is re-started.

Fairlead

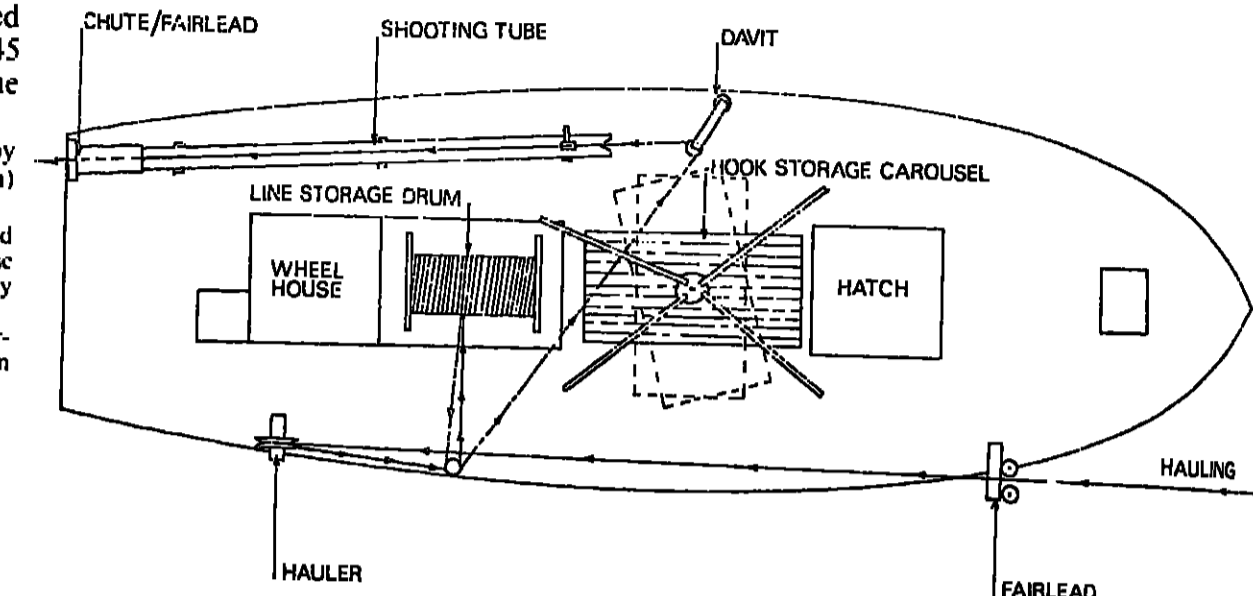
Hauling is carried out over the starboard side, the line to the hauler being first led over a three-roller fairlead mounted well forward. The fairlead, which is positioned over the side of the vessel when in use, can be swung inboard for mooring. From the hauler the line passes around a pulley

block on the starboard rail before going to the drum.

For shooting, the line leads off the drum, around the pulley block opposite, then across to a davit-mounted block on the port side. From there, it passes above the shooting tube and through a fairlead, into the sea at the stern.

Installation of the shooting tube was suggested by the WFA after one crewman was hurt in an accident common aboard line vessels; he was hooked through the finger and dragged towards the stern.

The suggestion was to enter the hooks into a slotted tube before clipping the snoods onto the line. In this way, the



This drawing shows the layout of the snood clip system for the mechanised longline trials aboard the *San Joseph*.

hooks are prevented from flicking upwards as the line carries them aft along the boat and into the sea.

In addition to enabling shooting to be carried out with much greater safety, the tube and fairlead prevent the line fouling the stern during manoeuvring.

The line used by the *San Joseph* is 8mm dia. spun nylon Greenfil, supplied by Bridport Gundry. Snoods are

each made up of a Mustad round bent No. 7 hook with swivel, attached to a Luhr Jensen LJ70 snood clip by one mm dia. rigid stainless steel wire. The overall length of the snood including the clip, is 305 mm.

Although this is quite short by normal standards, the snoods appear to be just as effective as longer ones.

The snood storage carousel, mounted forward of the line

drum, rotates around a vertical spindle fitted with a brake which enables the structure to be locked in several different positions. Housed in the carousel are 20 racks carrying 200 snoods each, a total of 4,000 snoods.

Each rack can be extended or, if necessary, removed from the carousel for baiting, shooting and hook replacement when hauling. The racks can be inserted or removed

from either end of the carousel.

Before starting the shooting operation, the carousel is rotated to a position convenient for attaching the snoods to the line.

A buffer store of baited snoods is then built up. This is done by taking several hundred snoods from one of the racks, baiting the hooks with mackerel and placing the hooks over a sloping wire

which feeds down to the shooting tube.

Opportunity is also taken at this stage to load the shooting tube with baited hooks ready for clipping onto the line.

After this has been done, the line from the drum is threaded through the various blocks and fairlead to the stern of the vessel. A dahn is then attached to the end of the line and streamed away, the line being drawn off the drum by way of the boat. After sufficient line has been paid away, an anchor is attached and shooting begins.

Three men

This is a three-man operation. One man, stationed in front of the carousel, takes one snood at a time from the rack, baits the hook and places the snood on the sloping wire to maintain the buffer store.

The second man takes the snoods off the wire and enters the baited hooks into the shooting tube.

The third man, stationed alongside the shooting tube, clips the snoods onto the passing longline at the required spacing.

When all the snoods on the first rack in the carousel have been used, the rack is pushed back into its retracted position and the next one is extended for use. Having emptied all the racks on one side of the carousel, it is then swung through 180 degrees to bring the racks on the opposite side into use.

Once all the snoods have been shot, the second anchor and dahn are attached to the line.

When ready to haul the gear (typically after about two hours), the boat approaches then retrieves the dahn, anchor and end of the line. The line is then led over the fairlead and hauler to the drum, the hydraulic pump is clutched in and the hauler and drum set to haul.

As the hooked fish come up to the fairlead, one man unclips the snoods from the line and places the fish on one side to await hook removal and gutting when hauling is finished.

Snoods without fish attached are allowed to pass over the fairlead where they are unclipped by a second man. He then removes any returned bait and passes the

snoods to a third man who replaces them on the carousel racks. Damaged snoods are placed on one side for repair or replacement later.

After all the snoods have been hauled, the second anchor and dahn are brought aboard. The gear is then ready for re-baiting and shooting.

Since the initial trials earlier this year, *San Joseph* has continued to use the system commercially with Brian Magee in command. During this time the system has worked well.

The advantages of using the snood clip system with carousel are:

1 **Faster Hauling.** Hauling can be continuous since the fish need not be removed from the hooks during hauling. The snood, complete with fish, is simply unclipped from the line and placed in the deck pound until later.

2 **Reduced turnaround time.** The gear can be baited and shot again immediately after hauling. As mentioned earlier, this cannot be done in traditional lining.

3 **Increased safety during shooting.** Since the snoods are clipped to the line with the hooks enclosed in the shooting tube, there is no risk of a man being snagged by a hook should there be a sudden surge in the line.

4 **Saving in deck space.** Storage of the line on a single large drum and the use of a carousel for the snoods enables a great saving to be made in the space of the gear occupies on deck. The traditional method requires 20 baskets for a line with 4,000 hooks, and even if GRP bins are used, seven of these (holding 600 hooks each) are required.

5 **Easier handling.** The use of snood clips and an efficient storage system enables longlining to be carried out with a relatively inexperienced crew. Traditional longlining requires a well-practiced crew to work the gear efficiently without major tangles.

6 **Easier repairs.** Since the snoods can be unclipped from the line, damaged hooks can simply be rejected. With traditional lines, a lengthy period has to be spent overhauling to maintain the hooks in good condition.

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Buoyancy of Powerblock floats: 1.2-7.5 Kg.

Buoyancy of Cylindrical floats: 0.3-1.6 Kg.

Buoyancy of Net buoys: 2-310 Kg.

Buoyancy of Bar buoys: 7.5-258 Kg.

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Powerblock, flotteurs type cylindrique, bouées de tous modèles etc.

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Flottabilité des flotteurs type Powerblock: 1,2 à 7,5 kg.

Flottabilité des flotteurs type Cylindrique: 0,3 à 1,6 kg.

Flottabilité des bouées: 2 à 310 kg.

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Una buena captura depende de que el equipo reúna las mejores cualidades.

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موات الأبحارية 2.0 - 310.0

الموات القمية 7.5 - 258.0

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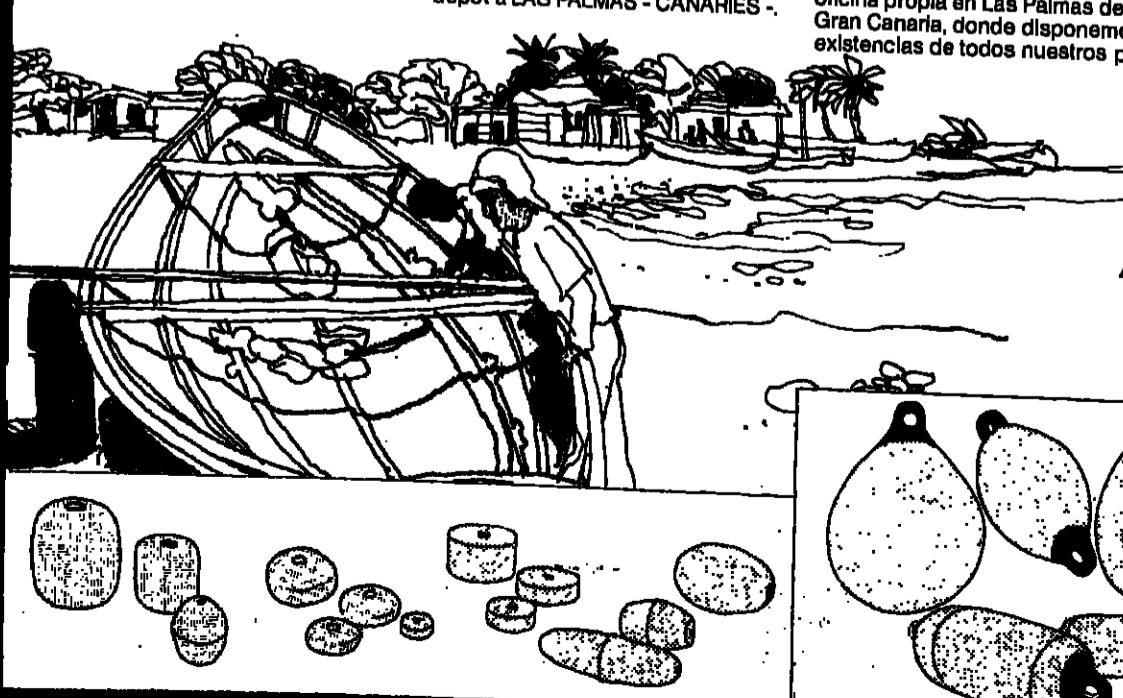


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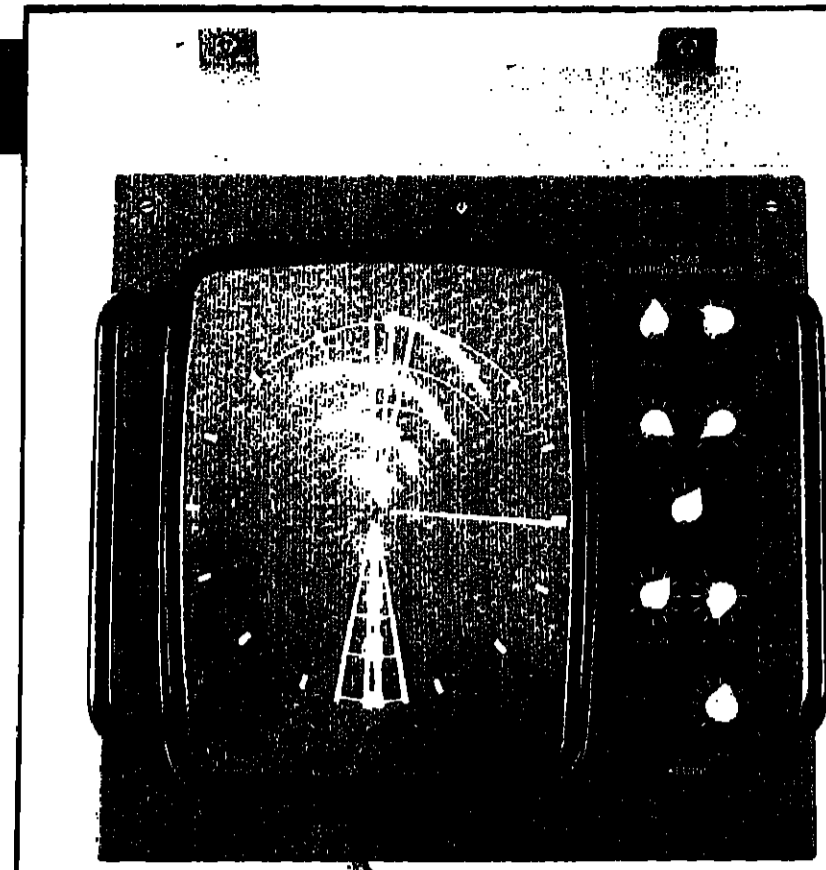


Fig. 1. Display Unit of the Atlas Fishing Sonar 950

S. MROSS of Krupp Atlas Elektronik describes his company's new concept in long-range fish detection

Fishing with the Atlas 950 panoramic sonar...

DURING the Scottish Fishing Exhibition Catch '78 in Aberdeen Krupp Atlas Elektronik presented, for the first time to the fishing community, their latest development in fish detection, the Atlas Fishing Sonar 950.

Presented at the Aberdeen show

The most interesting features of the equipment are the new display unit (Fig. 1) and the hydroacoustic multi-beam transceiver system. The latter enables a sector of 90 degrees to be illuminated by each single ping.

For the presentation of the huge amount of information received during each sounding period, a panoramic PPJ display, using a 44 cm TV tube, has been chosen.

As the total sonar information is stored by a micro-electronic memory, a steady, flicker-free, daylight picture is generated, allowing a relaxed observation of the screen.

The total picture innovation on the screen is as fast as the pulse repetition rate, resulting in an instantaneous recognition of shoals and their position relative to the vessel.

Two planes

Targets are shown simultaneously in two planes, one perpendicular to the other (e.g. horizontal and vertical). The position and the geometric pattern of the shoal are presented true-to-scale on a brilliant modulated, radar-like indication.

Signal to noise ratio for reverberation and ship's own noise is much improved due to a special signal processing method, the so-called "piling" of up to four successive pictures.

Interference from other sonars and sounders is also rejected by means of this geometric picture processing. So the "false alarm" rate (misleading echoes) is extremely low. The viewer can almost be sure that the echoes, seen on the screen, are indicative of fish.

Listening

In parallel to the optical display, is a new sectoral listening channel, which facilitates the identification of echo direction and the correlation to the echo frequency.

It will be clear that with the panoramic display described above for the Atlas Fishing Sonar 950, the old step-by-step searchlight ranging method is unsuitable.

With the very long period needed for scanning a greater sector (up to 10 minutes for 210° degrees), the ship's

movement during this time and the occurrence of "dead zones" would result in an uncorrelated, distorted and, hence, untrue picture.

Therefore, we decided to depart from the old searchlight principle, introducing a powerful multi-beam acoustical illumination of the sea with a multi-channel sectoral reception.

The output of this system is the multi-element high-power PZT ceramic transducer, which has been employed for many years with the Atlas fish finding equipment.

This transducer transmits stronger pulses than any other system known. Equally important is the possibility whereby groups of elements can be built up with the uniformly high accuracy, essential for the application of so-called "phase synthesis" methods.

Beam pattern

By this technique, the beam pattern and different beam directions can be formed electronically. This allows super-fast electronic training of a sharply focused transmission beam and a multi-channel reception system for echoes from different directions ("Preformed beams").

Finally, the side lobes of the beam pattern are considerably reduced, which is essential for the reduction of reverberation and other interference (Fig. 2).

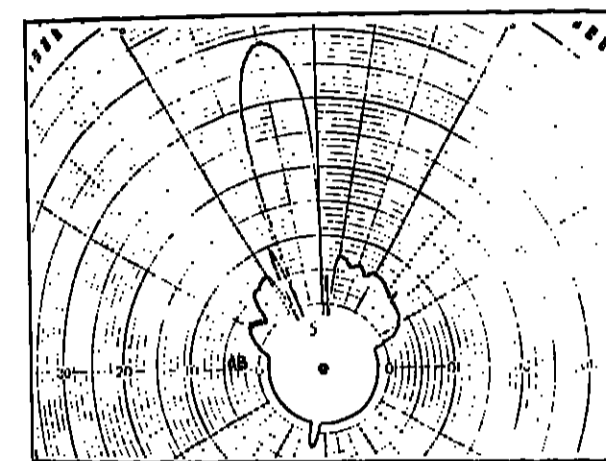
Each transmission pulse of the Atlas Fishing Sonar 950 covers a sector of 90 degrees. It is radiated in the form of 12 wedges in a bundle of 12 beams (Fig. 3).

During reception, the 12 beams form 12 directional reception channels for a simultaneous reception in 12 overlapping segments for the 90 degree sector. This allows a correct assignment of positional echo information.

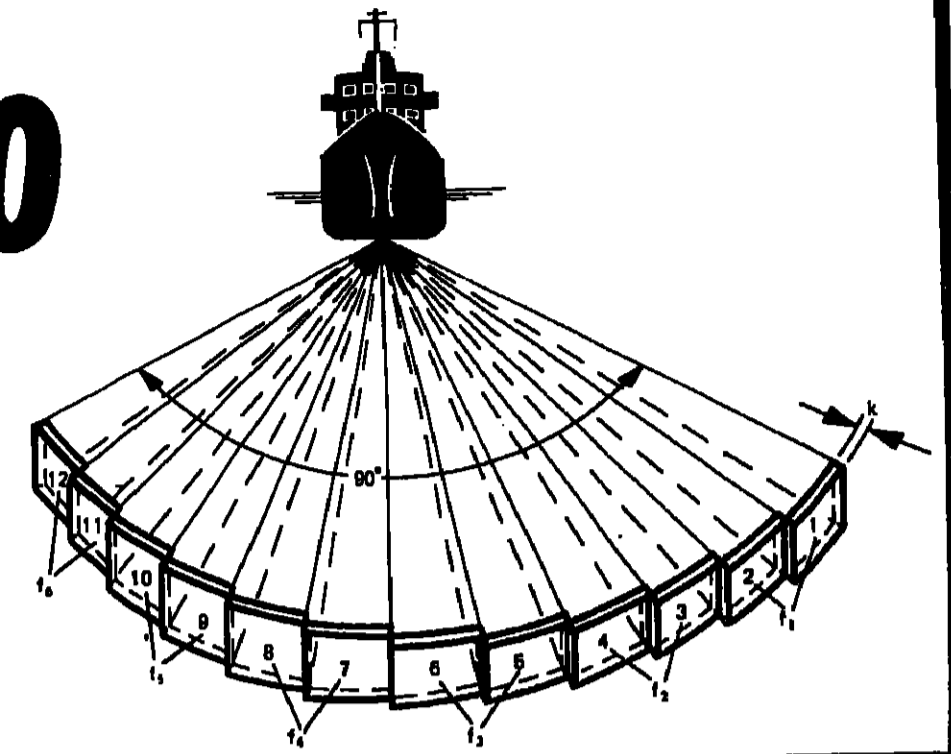
As an echo can appear in several adjacent channels, a special interpolation system is used for the evaluation of the correct geometric pattern of the shoal to be displayed with optimum attitude on the screen.

S. MROSS of Krupp Atlas Elektronik describes his company's new concept in long-range fish detection

Fishing with the Atlas 950 panoramic sonar...



Figs. 2 and 3. The acoustic multi-beam system



The high intensity sound pulses of the Atlas Fishing Sonar 950 hit every target within the sector many times a minute. On the steady daylight display, each echo is permanently presented and updated. Therefore the actual range performance is exceptional, even in shallow water. In practice it has been proved to be far superior to that of any searchlight sonar presently on the market.

Scottish skipper Jim Slater, who installed the new sonar in his purse seiner *Sette Marie* last winter says: "I detected small spike echoes of pilchards 10 fathoms high on the bottom in 40 fathoms of water at a range of 4,000 metres; and mackerel at 3,500 metres in 40 fathoms of water between six vessels. The 950 is also excellent for spotting wrecks."

The large amount of information produced by the multi-beam acoustic system during each sounding cycle necessitated the display concept described above for visualisation of all information on one screen.

Simultaneous

Information from two perpendicular planes is presented simultaneously by the two display sectors. The planes can be positioned in any direction by mechanical training and/or tilting of the transducer. As a result, gapless searching for fish becomes easy, enabling big areas of the sea to be covered quickly.

Position and pattern of a shoal is recognised early with

a relaxed observation of the screen. The position of the shoal with respect to the vessel is instantaneously identified. A quick overview of the tactical situation during the catching phase reduces the stress on the skipper.

The sophisticated equipment design keeps the operation simple. Experienced skippers have become familiar with the equipment after only 20 minutes of instruction and training. There is no need to study complicated handbooks or attend special training courses.

Three units

The equipment consists of three units: display, transceiver, and hull unit.

Installation of this sonar is simpler than that of many of the more conventional equipments. The display unit is compact and can be easily installed even on the smallest bridge. Only one cable is necessary between the bridge and the hull compartment. The installation of the latter is the same as for that of an ordinary sonar's hull unit. If the transducer shall be damaged by an underwater obstacle, it can easily be exchanged without docking of the ship.

Special electronic simulation circuits and simple trouble shooting routines are part of the integrated service concept, the aim of which is to reduce service costs by reducing repair-time. Thus a maximum of availability can be assured using a minimum of special expertise.

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THE LATEST NEWS ON FISHERIES

During the period 20-26 November The 7th International Fisheries Fair, Nor-Fishing '78 - will be held in Oslo. This is a trade fair of a high, international standard, where you will meet people from all over the world, with a strong interest in and knowledge of the fisheries industry. Nor-Fishing is considered to be one of the leading fisheries fairs in the world. Large and small firms present their products and news for the fisheries industry, and you will have a unique opportunity to find out about the very latest news in this field.

In conjunction with the exhibition we invite you to participate in the seminars to be held at The Sjølyst Centre.

Nor-Fishing '78

The International Nor-Fishing seminar: POST-HARVEST TECHNOLOGY AND INVESTMENT IN DEVELOPING FISHERIES

20th Nov. Film presentation: TARGETS FOR FISHERIES DEVELOPMENT. Opening dinner - Norwegian evening (Special registration is required. Attendance Nkr. 200.-).

21st Nov. POST-HARVEST TECHNOLOGY. Speakers: F.A. Peterkin, Project Coordinator for IDRC, Guyana Food Processors Ltd., Guyana. Dr. Wolfgang Krone, Chief, Fish Utilization and Marketing Service, FAO, Italy. Mrs. J. Maud Kordyla, Officer-in-Charge, Food Research Institute, Ghana. Gudrun Løvdal, Managing Director, FIDECO (Fisheries Development Co. Ltd.), Norway. Ahmed Kamal, MARO, Malaysia.

The first session will be devoted to the improvements of post-harvest technology in developing fisheries and to means of expanding the use of underexploited resources through more efficient handling and preservation systems, new products and processing methods and better market identification and promotion. The question of reducing post-harvest losses and the use of fresh fish and underutilized species will receive particular attention.

INVESTMENT NEEDS IN DEVELOPING FISHERIES. Speakers: Ducksoo Lee, Chief, Agriculture

Division, South Asia Projects Dept., The World Bank, Washington D.C., USA. Dr. Eng. H. Nilsen-Moe, Norconsult AS, Norway.

T. Olorunsola, Managing Director, Niger Sea Food Ltd., Nigeria. Tengku Ubaidillah bin Abdul Radzi, Director General of Fisheries, Ministry of Agriculture and Fisheries, Malaysia.

Mas Atsuo, Senior Adviser, FAO Investment Centre, Italy. The second session will discuss the specific investments required by developing fisheries in infrastructure, processing, distribution, storage and marketing facilities and how the necessary transfer of technology in both hardware (capital items) and software (know-how) might be best achieved. Representatives of developing countries will have an opportunity to express their views on the needs of their fisheries for investment in post-harvest technology.

22nd Nov. THE FUNDING OF INVESTMENT. Speakers: Per Gustavsen, Director, Council of the Regional Banks of Norway, Norway. Zaki Azam, Project Manager, Fisheries and Livestock Projects Dept., Asian Development Bank, The Philippines. Julio Luna, Chief, Fishery Sector, Inter-American Development Bank, Washington D.C., USA. Arvid Fløegstad, Director, Ekspart-Innans AS, Norway. Ahmed H. Radwan, Economic Adviser, Abu Dhabi Fund for Arab Economic Development, Abu Dhabi, United Arab Emirates.

The third session will consist of a review of potential international collaboration and assistance in funding these investment needs. Consideration will be given to criteria for investment project preparation, to the role of joint ventures and similar arrangements, to the funding activities of international and commercial banks and to such associated factors as suppliers' credit systems and credit insurance scheme.

Proceedings and discussions at the International seminar will be in English. Seminar fee: Nkr. 1,200.-, papers and luncheons included. Registrants will be charged 10% of the registration fee upon cancellation.

The national Nor-Fishing seminar: (in Norwegian only) EXPANSION POSSIBILITIES IN BLUE WHITING FISHING

24th Nov. Resource possibilities in blue whiting fishing. Area of distribution and catch possibilities. Fishing rights and economic importance. Catch-technical conditions. Gear and catch techniques. Fish-finding equipment. Products and markets. Panel debate on catch techniques and requirements of equipment. The participation fee for the national seminar is Nkr. 200.-, papers and luncheon included. Please return the filled-in coupon below. We will send you the invoice with confirmation of your participation. Seminar programme subject to alteration.

In November Oslo stands forth as a "city of light" as all of the Christmas displays begin at this time. For this reason you will have the chance to make pleasant shopping trips. In addition, we strongly recommend visits to the many restaurants, which offer typical Norwegian Christmas specialties. We hope you will visit Oslo in November, and have some memorable days with people from all over the world sharing your interests.

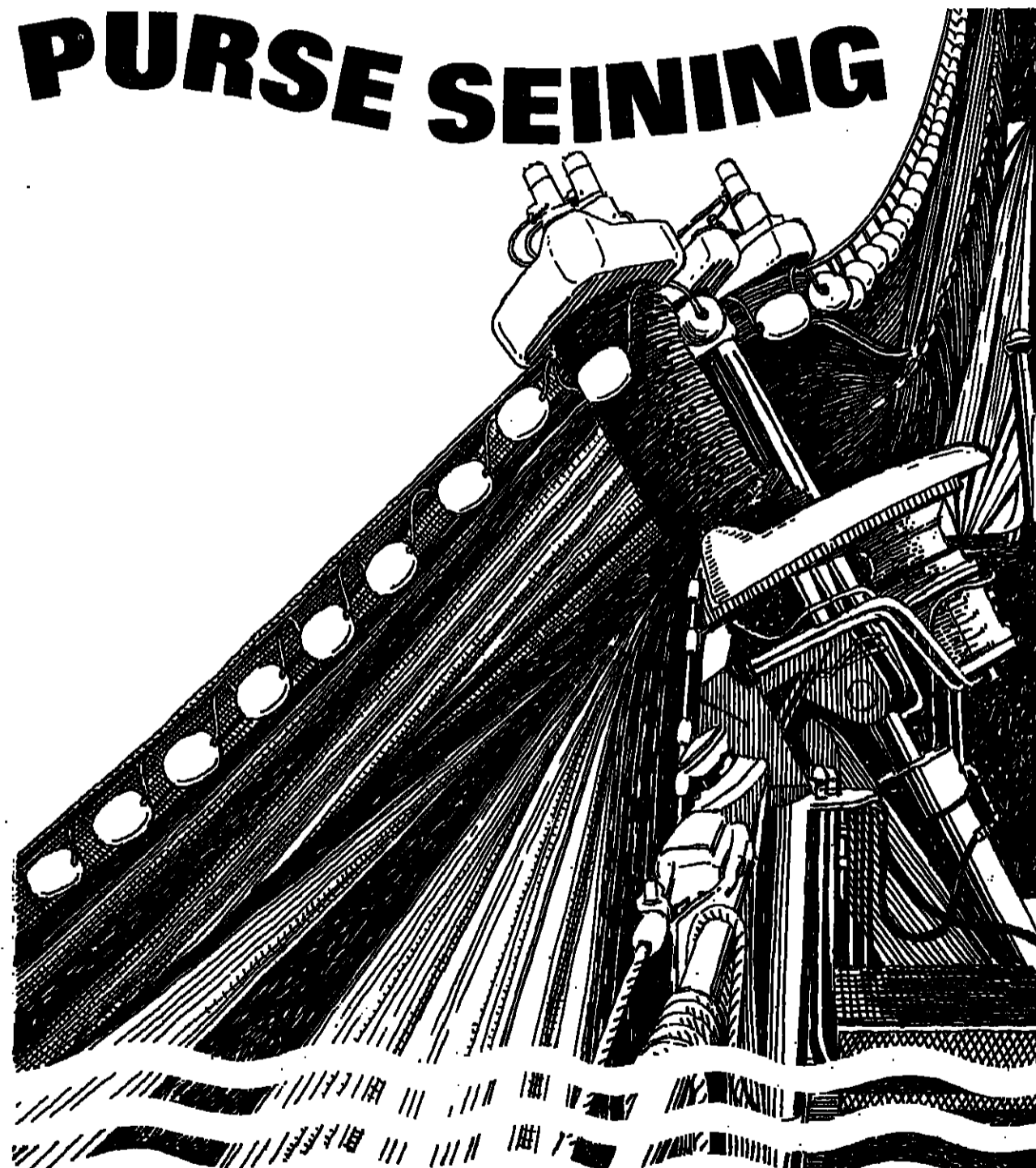
Mond. 12-18, Week. 10-18, Sat. 10-18, Sund. 13-18. Exhibition, Pairs and catalogue Nkr. 20.-

To: Nor-Fishing '78, Norges Varesenter, P.O. Box 130 Skøyen, Oslo 2, Norway.

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Shrimp peeler guide...

COMPLETE specifications of the Jonsson Model 31T tail-on shrimp peeling and deveining machine are set out in a two-page bulletin available from Gregor Jonsson Associates Inc. The machine described can process tail-on round, tail-on butterfly or tail-on western shrimp.

The bulletin explains how the machine can peel and devein shrimp in sizes from 10 to 90 lb. at a rate of 3800 an hour.

A processing capacity chart relates pounds an hour production — from 40 to 380 lb/hr, depending on shrimp size.

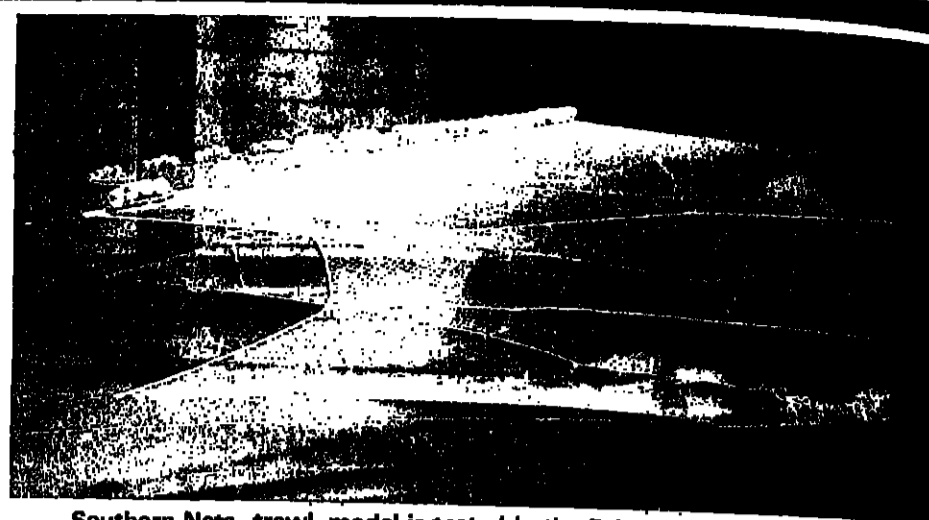
Bulletin 16 on the Model 31T machine can be obtained from Gregor Jonsson Associates Inc., 1520 Berkeley Road, Highland Park, Illinois 60035, USA.

product news

METHODS • GEAR • EQUIPMENT
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TRAWL TESTS IN FLUME TANK

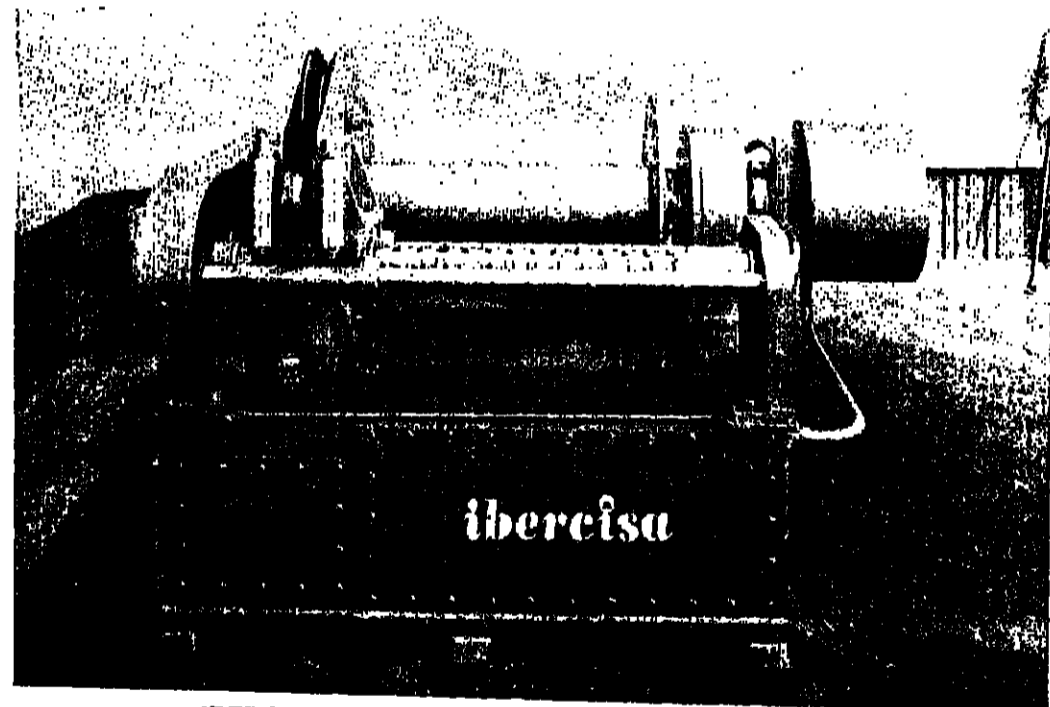
British firm adds to its wide range of nets



Southern Nets trawl model is tested in the British WFA's flume tank.

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SOUTHERN Nets of Rye, Sussex, is opening new premises for the production of trawls, which will include the new 400 series wing trawls for round fish.

The WFA flume tank in Hull has been used by the company for one-fifth scale model tests of the ten-fathom wing trawl. The tests indicate the best possible combination of bridle length, otter board size, float arrangement and weight and type of ground-rope rig.

"The flume tank facilities are particularly useful for the fine tailoring required of any new trawl design," says Southern Nets.

Popular

Another trawl being tested is the 600 series Inca. This is a high-lift combination trawl for round and flat fish. It is claimed to have proved popular for catching cod, huss, whiting, cuttle fish and squid.

As with the Southern Nets wing trawls, Inca trawls are available in sizes up to and including 16 fathoms on the groundrope and are supplied with all rigging details.

The company says its 300 series of flatfish trawls "continues to be a best-seller." The range has now been increased to 16 fathoms. Trawls are usually supplied "off the shelf" but they can be custom-made to individual requirements.

Extra

Southern Nets also makes beam trawls. These have light or heavy grade synthetic fibre webbing and beam sizes range from 6, 8, 10, 12 to 14 ft. Heavy-duty shrimp cod-ends are supplied as an extra.

The company has perfected its trawls with the help of Grimsby College of Technology's fishing gear consultant, C. C. Radcliffe, from designs by managing director C. E. Holland.

To meet increasing demands through the swing to inshore fishing and trammel net fish, Southern Nets supplies a full range of materials necessary for making nets for these methods.

Gill nets from monofilament or nylon are also available in many different sizes. They are supplied fully rigged or in sheet form with all accessories for rigging.

Deutz engines in seven small trawlers

THE SEVENTH and latest Castlewood class trawler built by the Wood Group of Aberdeen, relics, like her six sister vessels, on a Deutz diesel engine for main propulsion.

According to the Wood Group (Trawlers Division), Deutz 716 model diesel engines were chosen early in the design stage of the Castlewood class vessels because they were of low profile and compact build. This meant that the engine house could be kept to minimum proportions.

The engines have proved exceptionally reliable, according to a Wood Group spokesman. "The only change we would make in future," he said, "would be to use the

slightly more powerful 816 model Deutz, because some of our skippers have said they could use even more power when trawling; although the boats are mostly engaged in seine-net fishing."

The 75 ft. (22.86 metre) boats have proved particularly effective since the first three were built at the Wood Group's John Lewis shipyard, Aberdeen, four years ago. Two more of the boats, which are designed to catch white fish and herring, were constructed at Campbelltown Shipyard, Campbeltown; the other two were built at John Lewis.

The boats are run by independent skippers working in conjunction with the Wood Group.

Hauler changes with the fishing

ONE of the problems faced by the owner of the small inshore boat seeking to mechanise the handling of his gear is that of changing patterns of fishing, from season to season, species to species and area to area.

He needs an economical machine that will enable him to take on anything from gill netting to lobster potting to long lining.

The British-made Cattermarine net/pot hauler is designed to allow for this variety of requirements. It can incorporate net hauler, slave hauler wheels with auto rope ejection knife or line hauler wheels, all pedestal mounted.

Cattermarine is using a special polyurethane material on the inside faces of its one metric ton and 0.75 ton slave hauler wheels for pot hauling. This is claimed not to wear, to give an excellent grip and to keep down rope wear.

According to Mr. H. F. Macintosh, founder and original designer of the Cattermarine haulers, the slave hauler wheels and new lining were first tried out in the boat *Michael Harvey* in crabbing and with a Welsh lobster potter three years ago.

The Cattermarine one ton and 0.75 ton pot hauler with capstan head also gives flexibility to the inshore fisherman.

If he is fishing rough grounds where there may be



Cattermarine hydraulic net and pot hauler.

fishers, he can change from the slave hauler wheels with auto rope ejection to capstan head hauling. The wheels are made of a heat-treated aluminium for lightness and

resistance to corrosion.

Cattermarine's power pack was designed by the present manufacturers of the haulers, Drum Engineering Ltd. It consists of a two-gallon cast aluminium tank containing the pump, relief valve and filter. An electro-magnetic clutch is built into the pulley wheel drive and is switch-operated from the wheelhouse.

An air cooler is used for flows of more than 4.5 gallons min. such as in the 33 ft. boat *Flyer II*, owned by Mr. A. Henley and working out of Benbridge, Isle of Wight.

Further information about the Cattermarine range can be obtained from Mr. Macintosh, 15 Glenholme Close, Stubbington, Hampshire, England.

Winch control

KOBELT now offers a complete package of non-corrosive pneumatic controls for almost any marine and industrial winch system.

Available in the package are controls for slip clutches and brakes; three and four-way positioner cylinders and valves; motor speed controls; relay and interlocking valves.

The controls, made from silicon brass for durability and decessat to keep them price-competitive, carry a five-year warranty on all metal parts, and a two-year warranty on the synthetic seals.

Further information and names of distributors from: J. Kobelt Manufacturing, 235 E. 5th Avenue, Vancouver, B.C., Canada, V5T 1H2.



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FISH PORTIONS FROM TRIMMINGS

THE BRITISH engineering firm Guylew Manufacturing of Great Yarmouth last year introduced a new system for reforming fish portions with frozen undersize fillets and trimmings. One of the machines has now been delivered to the State Ministry of Fisheries in Poland.

There it is to be used to process a range of products, including reformed scampi and sardines, high-grade fish fingers and other portions.

This order is very significant, says Mr. John Preston, managing director of Curlew Overseas Ltd. "It could be the

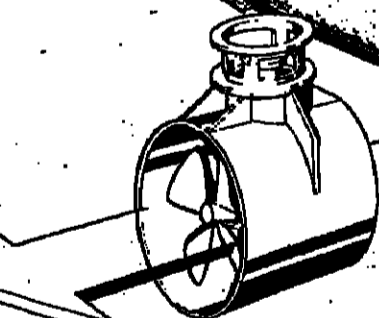
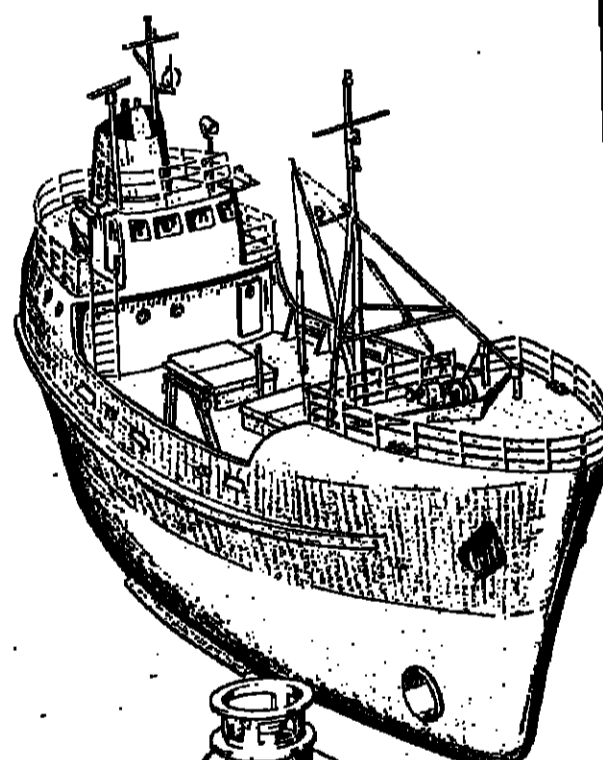
forerunner of many export orders for this machine, particularly in areas where there is a good supply of fish although perhaps in mixed species and sizes."

The Guylew reformed fish portion system was seen by many people in the fish industry when it was demonstrated at Torry Research Station during a programme connected with the utilisation of species such as blue whiting.

Further information about the system can be obtained from Guylew Manufacturing Ltd., Riverside Works, Gorleston, Great Yarmouth.

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OF PLANT COMPANIES

Purse seine super winch

A NEW powerful hydraulic purse seine winch with pursing speeds nearly twice as fast as those of existing models has been introduced by Marine Construction & Design Co. (MARCO).

"The model WS444 winch, named the SuperSeiner II, is designed for fast handling of the larger nets that are being adopted now, particularly in the growing tuna fishery in the south-western Pacific," said Charles R. Hart, Marco vice president.

"As an example of the winch's speed and power, in less than 20 minutes the 450 hp SuperSeiner II can purse a tuna net 1,000 fathoms long and 25 strips deep."

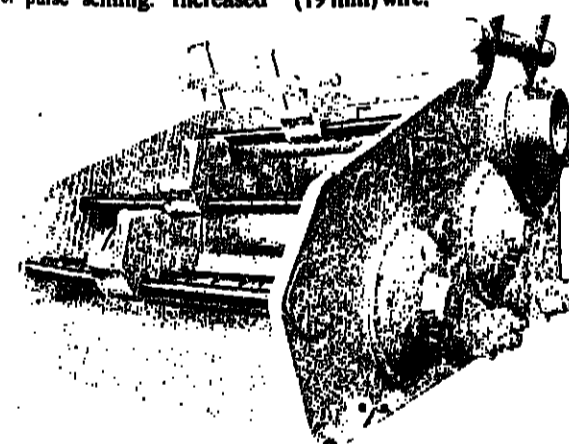
The SuperSeiner II has two independent hydraulic drives, one for the main purse drum and one for the forward purse and tow line drums. Separate drives permit each end of the purse line to be hauled independently.

Each drive has two operating modes for optimum performance during all stages of purse seining. Increased

hauling speeds are available for pursing and increased line pull (more than 20 tons) is available for lifting the rings.

Marco has designed the winch with drum capacities and line pulls that allow the entire net to be pursed on either the main purse drum or forward purse drum. Thus, in the event of a roll-up, the net can be pursed even if the roll-up occurs near either end of the net.

Cable capacity of the main drum is 1,800 fathoms of 3/4 in. (19 mm) wire.



The "SuperSeiner II", a new hydraulic tuna purse seine winch from Marco

CHANNEL METER RANGE

THE Channel Electronics 6000 Series portable digital pH metre measures 0-14 pH plus temperature over the range -30 deg. to +150 deg. C.R.T.

It is housed in a robust injection-moulded case with 10.2 mm height L.E.D.

readout. The series is claimed to offer fast and accurate measurement in three basic models.

Model 6060 provides pH measurement to a resolution of 0.1 pH and Model 6080 to a resolution of 0.01 pH. Temperature on both in-

struments is to a resolution of 1 deg. C. A third instrument, the Model 6090 offers -999 to +999 mV with a resolution of 1.0 mV.

Models 6060 and 6080 are supplied complete with combined plastic bodied pH electrode and steel-bodied temperature compensation/measurement probe.

Using standard MN1500 (manganese alkaline) batteries, the 6000 Series allows up to 35 hours continuous use or 60 hour intermittent use.

As an option, the instrument can be provided with type AA rechargeable cells plus a mains recharger unit. A further option is a good-quality carrying case which has a separate pocket for the probes.

Further information from Channel Electronics (Sussex) Ltd., P.O. Box 58, Seaford BN25 3JB, Sussex, England.

IN BRIEF

Lloyd's Register of Shipping has granted its certificate of quality approval to Bruynzeel, marine plywood manufactured under the Quality Approval Scheme for materials and equipment for yachts and small craft.

The certification procedure entails regular inspection of the Bruynzeel Multipanel BV plant at Zaandam, Holland, by Lloyd's Register surveyors to verify that the necessary quality control is maintained to ensure a consistent quality product.

JAMES TANTON has joined Marine Ltd. as operations manager for Francis Searchlights. He has a degree in naval architecture and for the past three years has been director and manager of a subsidiary of British United Trawlers. He will have full responsibility for development of Francis Searchlights operations in the marine, security and emergency services markets of the world.

WHERE IT'S ALL IN EASY REACH

EVERYTHING within easy reach to find fish, navigate, communicate or manoeuvre.

This is the instrument-packed wheelhouse of the West German wet fish stern trawler *Sonne*.

Described in *FN* in June, this compact ship is 54.2 metres long and is powered by an MaK 2400 hp engine. She was built by the Rickmers Werft yard for Hochseefischerei Nordstern AG.

Her main electronic equipment includes Krupp Atlas Fischfinder 781 echosounder and 781 net-zsonde (seen middle left) and two Atlas radars, a 6500S and a 5500.



Everything to hand... in the wheelhouse of the *Sonne*.

Inboard engines for open boats

THE MARINE division of Petters Ltd. has gone back to basics in order to create a new range of engines utilising "A" range lightweight units.

Aimed at less sophisticated markets than the Petter Mini-Six and Mini-Twin, the new modular engines are offered as direct drive units with or without a clutch, or with a gearbox.

Motivation for this work, says Petters, came from trials carried out on inshore fishing boats, including canoes, outriggers and small catamarans where the requirement was to produce the simplest possible propulsion system.

Exhaustive tests made on a variety of craft have proved the efficiency of the various systems, adds the company. "This work has proceeded with the knowledge and support of the British Ministry of Overseas Development and the Food and Agriculture

Based on this research, Petters says it can now offer a range of equipment suitable for small open boats at overall costs which will be competitive in operation with many existing outboard engines.

In these circumstances "the inherent benefits of diesel in terms of its economy, simplicity and reliability are seen to advantage."

The units are based on similar engines which have gained wide acceptance in a

variety of duties.

As with all marine division products, the concept is covered by the Petter "Blue Diamond" deal. This provides free installation guidance to boatbuilders and training courses at a nominal fee.

Kobel disc brakes are designed to work smoothly and efficiently over a long period of time. And to absorb more energy than any other disc brake that we know.

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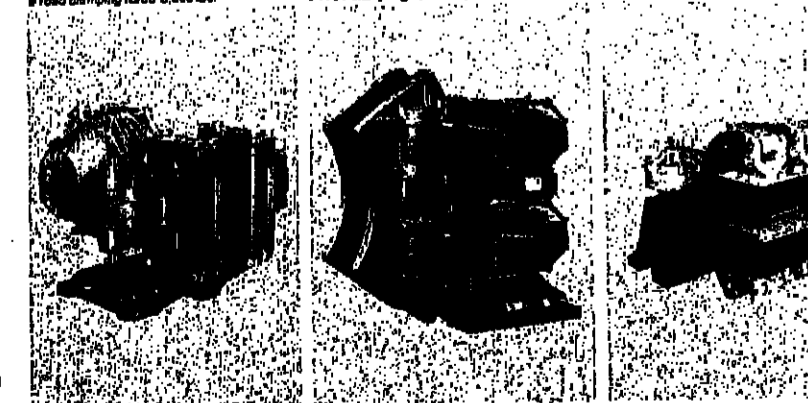
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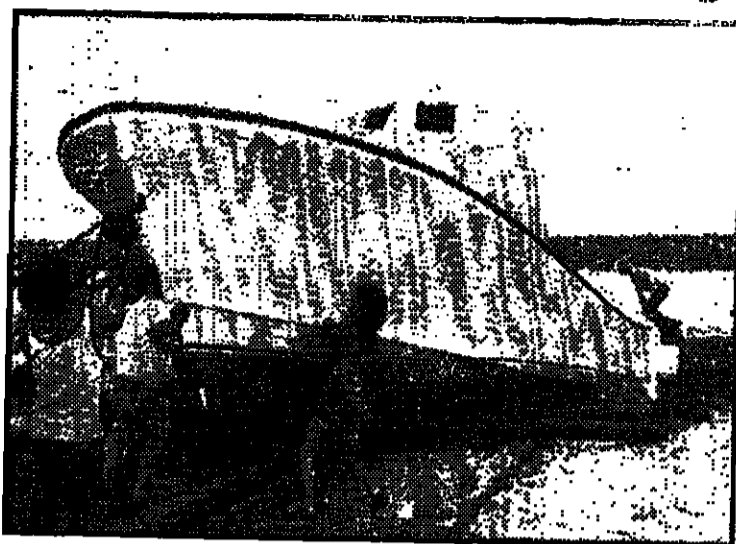
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The U.S. Fishing Industry WHAT'S IN IT FOR YOU?

If you're importing or exporting fish or fishing gear, the U.S. commercial fisheries are important. The world fishing picture is rapidly changing as coastal nations take control of their marine resources. Nations dependent on their distant-water fleets are finding their fisheries supplies dwindling as strict regulations limit their efforts off foreign shores.

What's available? What's going to be available? How do you keep informed on the rapidly changing and complex U.S. fishing policies, needs and opportunities?

NATIONAL FISHERMAN, the leading U.S. commercial fishing trade journal, has documented the industry in the first edition of

THE AMERICAN FISHERIES DIRECTORY AND REFERENCE BOOK

This is a complete 560-page source book for contacts and information that details regionally and nationally, landings, fleets and quotas plus all state and federal agencies that have a bearing on the industry. It includes thousands of names and addresses for:

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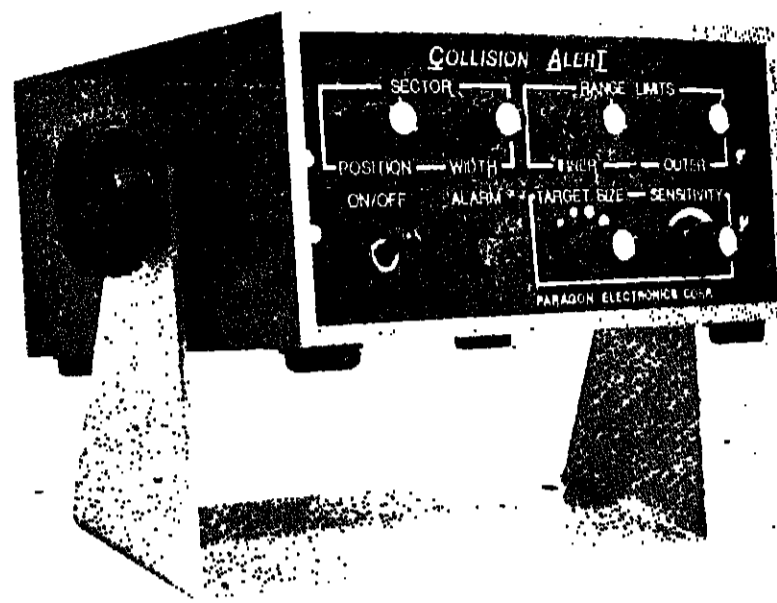
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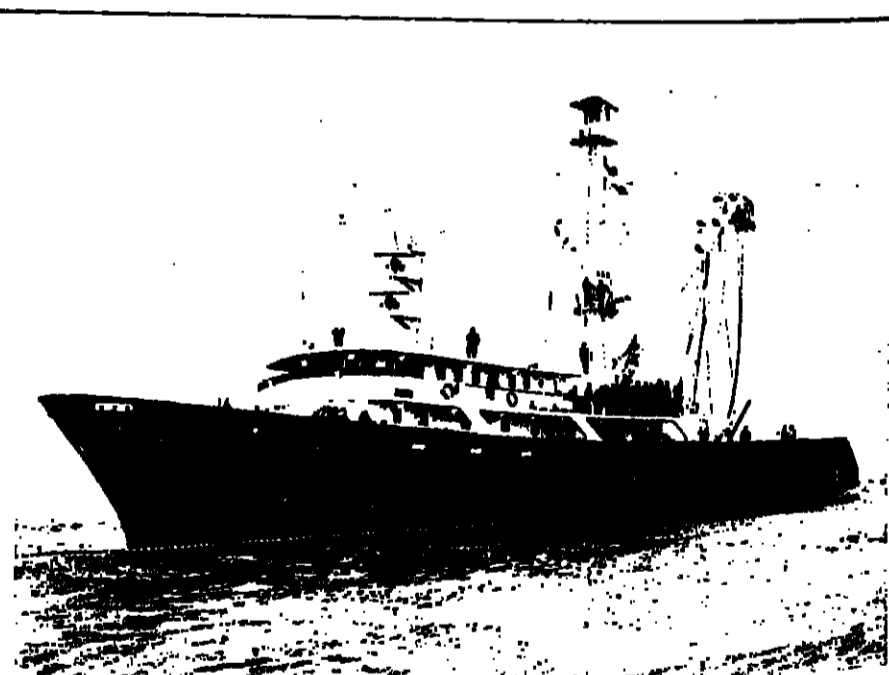
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ON BEHALF of the many thousands of trawlermen who have benefited from the pages of the *Trawlermen's Handbook*, I extend congratulations to Commander R. C. Oliver and his wife on the recent celebration of their Golden Wedding. This they did by donating £250 to Exmouth Scanner Appeal Fund because "of the thousands of local East Devon people it will help."

We in Fishing News Books have a particular regard for Commander

Oliver, not only for his kindly personality, but because of the great service done by him in converting the original little booklet known as the "Handy Billy" among early trawlermen into a work which has rendered outstanding service to the fishing community not only of Britain but of many other countries as well. For, since its first publication in 1965, thousands of copies have been distributed the world over.

After his long service with the Royal Navy during which he saw much active service in the Mediterranean in World War II and won the DCM, he joined the administrative side of the fishing industry in Hull in 1952.

In particular he there concentrated on supplementing and expanding the work I have mentioned on behalf of the Hull Steam Trawlers Mutual Insurance and Protection Company Ltd. It was immediately successful as a major contribution of high value to fishermen and their general safety.

Lasting tribute

Since then, it has been steadily revised and improved, and is now standard and in itself a lasting tribute to the pioneering work done on it by Commander Oliver. To him and his bride of 50 years we extend our heartiest good wishes for continued happiness in their well-earned retirement.

I am very conscious of the debt owed to authors who devote knowledge, time and research to the compilation of works of practical and reference value. And so I welcome now the outstanding value of a million-word plus volume on which we are currently engaged. This is *Advances in Aquaculture*, the masterpiece organised by Dr. T. V. R. Pillay for FAO. I am full of admiration for its comprehensiveness and scope.

Into it are packed the contributions of 191 of the leading scientists of the world covering every major aspect of the modern practice of aquaculture. Their knowledge and research is embodied in a total of 116 papers spread over ten chapters.

Logically conceived

It is worthwhile listing these chapters for they show in very marked fashion the logical manner in which the book has been conceived and presented by Dr. Pillay and his associates. First of all they had to carefully peruse and assess the merit and content of the original papers and reduce duplication or superfluity wherever possible. Then came collation to chapters.

In these ten chapters and their accompanying papers, there is given the very latest round-up of advanced knowledge:

1. World Aquaculture and its Future Role. Nineteen authors provide 17 papers ranging over all effective world territories and major activities with social and economic implications as well as practical requirements and details.

2. Finfish Culture in Ponds. Here 46 authors in 29 papers (several papers are collective efforts) get down to

walkabout talkabout

with Arthur J Heighway



practical tasks involving construction for farming milkfish, carp, trout, turbot, tilapia, catfish, threadfin, and variations into sea water culture, pond culture with supporting activities in duck and pig raising—in fact every conceivable variation seems covered.

3. Culture of Crustaceans. This specialised field has 15 papers and 27 contributors dealing with the various shrimps and prawns in sea water and fresh as well as lobsters and the king crab.

4. Culture of Molluscs. Eleven papers and 16 authors deal not only with the edible oyster on a commercial scale but with the pearl oyster, the mussel, the scallop and it pays special attention to oyster mortalities and their control — and even the growing of oysters on mangroves.

5. Culture of Algae and Seaweeds. Three papers and four authors suffice for treatment of this specialised activity for which enthusiasts predict much potential.

6. Aquaculture in Raceways, Cages and Enclosures. Nine papers and 13 authors deal with special enterprises here, in the Far East, Africa, Norway and North America and tell of success in rearing yellow tail, turbot and Pacific salmon.

7. Wastes and use of Recirculating Water in Aquaculture. This is a fascinating chapter with its 12 papers and 25 authors. One paper has enrolled seven authors to fully review one important research project. This section has much of value to give for progress in industrialised states aiming at full use of all available resources.

8. Artificial Recruitment and Transplantations. This advanced phase of development requires six papers and eight authors for discussion of advances in Japan and Newfoundland dealing with salmon and ayu — promising aspects of culture are opened up.

9. Nutritional requirements and Feed

Two books for the practical marine fisherman are forthcoming. They are *Pelagic and Semi-Pelagic Trawling Gear* by that well-known and capable author John Garner, and *Refrigeration on Fishing Vessels* by J. H. Merritt of Torry Research Station.

The former author is known and his volume joins several earlier well known titles.

He has produced this work because of the increasing popularity and rewards being won by more discriminating selective search for specific species of fish and he has brought to the task all the ingenuity and skill acquired in his long experience. The illustrations of the specially designed gears are clear and on large sized pages. It will prove a useful book.

The work on *Refrigeration* is a new edition, fully revised and updated to include improvements in practice and operation made since its first publication in 1969. The steady expansion in fishing by the new countries in their 200-mile zones ensures a growing demand for it in order to win quality on the market.

Technology. This chapter is highly practical and is dealt with by eight papers and 16 authors and deals with special research into the requirements of cultivated warm water and coldwater species and levels of growth sustained in experiments on stocks. As with most other chapters, due attention is also paid to disease tendencies and their controls.

10. Genetics and Genetic Improvement of Fish. Necessarily highly scientific, this chapter with its six papers enrolls 17 authors in its coverage of experimental research on rainbow trout, channel catfish, carp and hybrids between European carp and Chinese carp on traditional fish farms in Asia.

Book in itself

I have given this amount of detail about each chapter for the simple reason that each is a book in itself. Exhaustive tables and ample illustrations are of course included.

I confess that when I first contemplated this book and was hit hard by the facts of its size and comprehensiveness, I made a suggestion in the hope of producing the work in sections suited to needs and thereby at a lesser cost to individual buyers. This was that it be divided into three sections covering freshwater, brackish and sea water requirements.

But no such division was feasible for the whole activity of aquaculture in both practical and scientific terms is so involved that interlocking impacts occur at every phase. Thus the book as planned and conceived is an entity.

It does justify its title: *Advances in Aquaculture*. It is the latest and most complete compendium of knowledge on all aspects of aquaculture and as such will be the final reference book on the subject for years ahead.

The 145 countries concerned with the UN Conference on the Law of the Sea have just finished another session in Geneva. But that won't be the end. Two more sessions are expected before the finale is reached, hopefully sometime in 1980.

Talks began December 1973. Main policies have been established — 'is said' — but argument still runs on tricky issues such as: rights of landlocked countries to sea fish and resources, who shares in the mineral wealth of nodules of nickel and copper, etc., lying on the floor of the seas, and of course that perennial vexed question of boundaries and the settlement of inevitable disputes. Altogether, there seems promise of great scope for sea lawyers in future. Meantime a new and enterprising journal entitled *Ocean World* (issued from Washington DC six times a year) tells me a mission by a consortium of US, Canadian, West German and Japanese companies has returned to Seattle after protracted practical tests in an area 865 nautical miles south-east of Hawaii.

By April last they had sucked up by special gear about 1000 tons of potato-sized nodules from a depth of three miles. And scientific investigators from the National Oceanic and Atmospheric Administration said they could not detect any deleterious effects from their operations. But it is the riches they MIGHT get that are worrying the Third World countries and they want some pickings. So there's a tall-feel ahead.

FAO lists science papers

FAO has collated details of serial publications (journals, report series, etc.) which regularly include papers on water environments and fisheries. Its first list was published in 1963.

Meeting demand for a revised version, FAO issued a preliminary edition with 1200 titles in 1975. Another 600 titles were included in a supplement in 1976, and 573 more in 1977. The supplement this year lists 646 titles.

World List of Aquatic Sciences and Fisheries. Serial Titles. Ref. FIDI/T Suppl.3. Obtainable from FAO, Rome.

A STITCH IN TIME SAVES NINE....

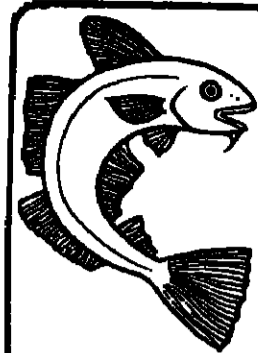
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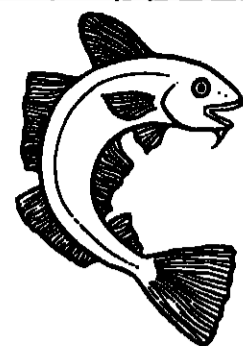
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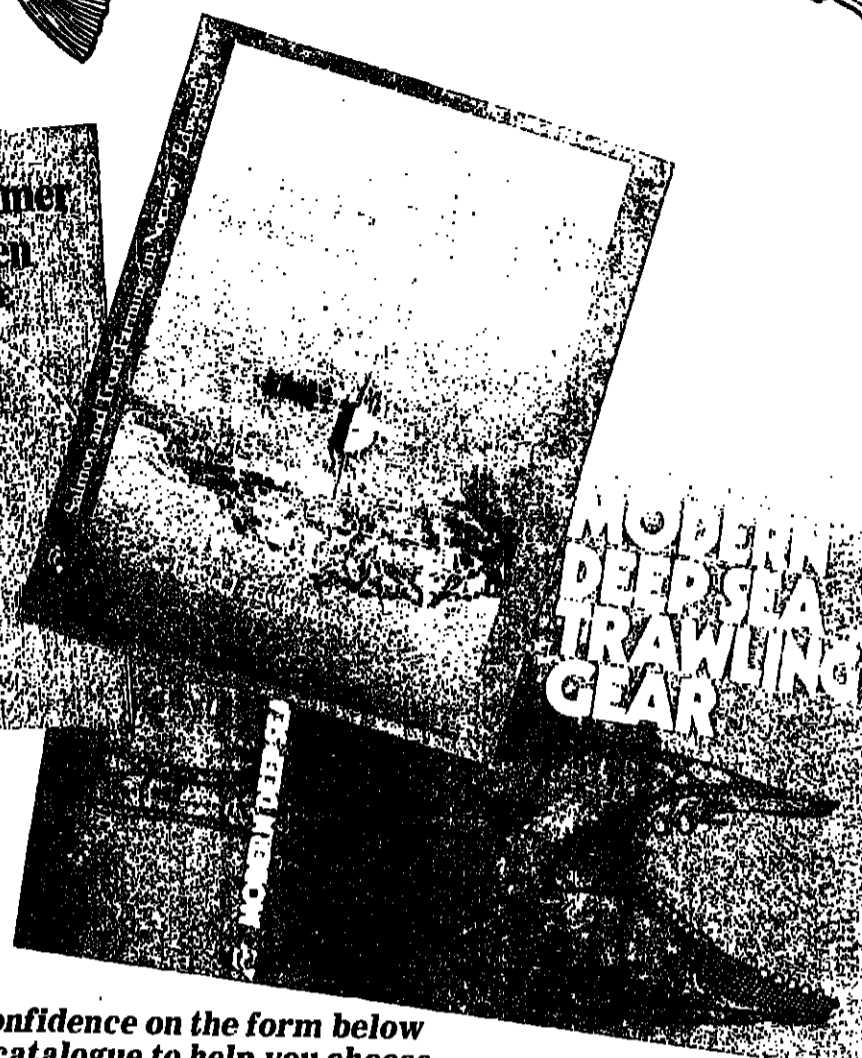
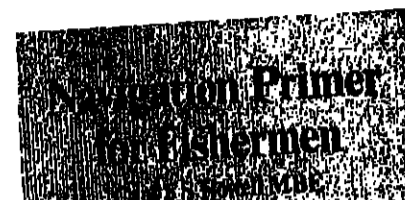


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The books page

THE GIANTS IN RUSSIA'S FLEET...

BY EARLY this year, five *Gorizont*-class giant trawlers had been built in the USSR for the country's deepsea fishing fleet.

The name ship of the class was sunk in a collision off the Isle of Wight in 1975, but the *Admiral Golovko*, *Aleksandr Torskyev*, *Ivan Sivko* and *Petr Sgibney* are among the 30 or so Soviet trawlers larger than 4,000 gross tons.

Brief details of this class and all the other big Soviet fishing ships are given in the Third Revised Edition of *Soviet Merchant Ships*.

The *Gorizont* trawlers are 111.38 metres long and have a gross tonnage of 4537 tons. Each ship is powered by two Sioda six-cylinder engines developing a total of 7,000 hp.

Reorganised "in the light of new information," the factory trawler section of *Soviet Merchant Ships* now lists some 850 trawlers. They include the first ten *Pushkin*-class vessels (built in Kiel in 1955 and 1956), with which the Soviet fishing industry began its massive introduction of refrigerated and processing stern trawlers.

This first order was followed by one for 14 placed with the same yard, Kieler Howaldtswerke.

Following these ships from 1958 onward came the procession of big trawlers that took Soviet fishing onto the oceans of the world.

Biggest

From Denmark came 25 *Skryplev*-class ships of 4700 gross tons and from France the three biggest trawlers ever built, the 6260-ton *Anatoly Khalin* and her two sister ships, delivered in 1965.

The East German yards

followed the *Tropiks* with some 140 *Atlantik*-type trawlers. These 82.2 metre long vessels were built by the VEB Volkswerft yard in Stralsund until 1973. Then, in 1975 and 1976 VEB Mafias Thesen built 24 in Wismar.

Meanwhile, the Stralsund yard had gone over to the new Super *Atlantik* class, starting with the prototype *Prometey* in 1971. By the end of 1974, the Soviet industry has taken delivery of some 75 of this latest class.

In Russian yards, the *Mayakovski* design gave way from 1970 to the *Luchegorsk* type of 83.3 metres built in

Klaipeda by the Baltiya yard and 83.9 metres built in Nikolayev by the Chernomorskiy yard. Some 80 of these vessels were built up to 1975.

Also in Nikolayev, the Okean yard was turning out another class, the big *Altay* trawlers of 107.5 metres and had completed 31 by 1975.

From 1974, the *Luchegorsk* evolved into the *Kronstut* type, 83.8 metres long, with modified funnel and superstructure. Sixty-eight of these ships were built up to the end of 1977.

In Klaipeda, the Baltiya yard has, since 1974, been

turning out a series of *Barentsyev* More-class trawlers 59 metres long and of 1500 gross tons. About 50 of these trawlers are believed to be on order. Each has a bulbous bow and is powered by a 2200 hp Skoda engine.

The book also lists the numerous different types of refrigerated fish carriers serving the Soviet fishing fleet. And it includes the ships in the fleet of floating factories.

Largest of these is the 26,400 gross ton *Vostok*, delivered in 1971 and still the only ship of her type and size in the Soviet fleet.

After the *Vostok*, the same

yard in Leningrad built three 18,455 ships that were basically fish meal factories.

But Poland has been the major supplier. Starting in 1963 with the B64 class *Pionersk*, *Stocmia* Gdansk delivered 14 by the end of 1967.

It followed these with the *Professor Baranov* class in 1967 and by the end of 1975 had delivered 35. It is now building its new B-670 class.

Also from a yard in Gdansk is the latest in what could be a new series of Polish-designed and built giant factory trawlers.

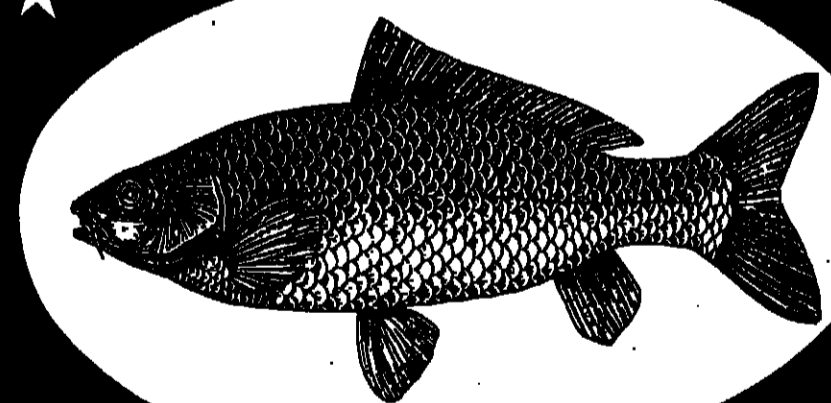
Trawler

She is many steps away in size, in capacity and performance from the first Pushkin-class in 1955. Now, thanks to the meticulous compilation of Ambrose Greenway (and the late Jerry Curtis), it is possible to trace these steps and to put ships, dimensions, builders and dates of those daunting totals of ships turned out in series of 20s, 50s and even 100s.

Published by Kenneth Mason, Hove, Sussex, England. 204 pages. Price £6 (plus postage).

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1. The fish to be washed will only get in touch with fresh supplies of water as the waste

water is immediately drained thus avoiding any contagious infecting of the fish.

2. There are no stagnant quantities of water liable to be slopped over by the motions of the ship.

3. In actual practice the cross current washing principle represents an individual washing of each fish due to its being rolled over and thoroughly jet sprayed from all sides.

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